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TOGA
Texas Optional Girder Analysis

Taya Retterer

February 15, 2012

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Introduction

- What is TOGA?
  - Texas Optional Girder Analysis
  - For Tx Girders and I Beams

Straight to an Example!

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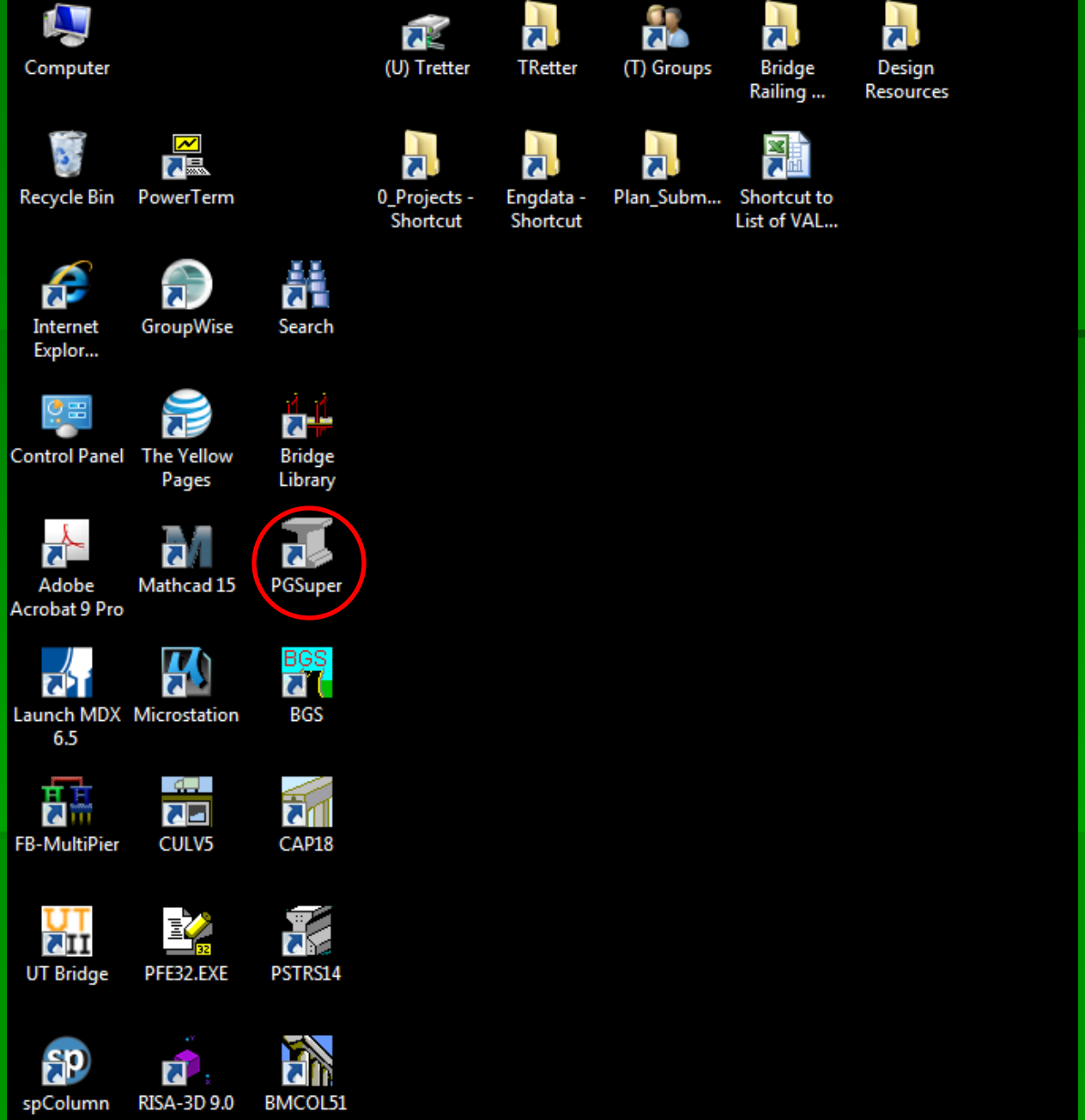

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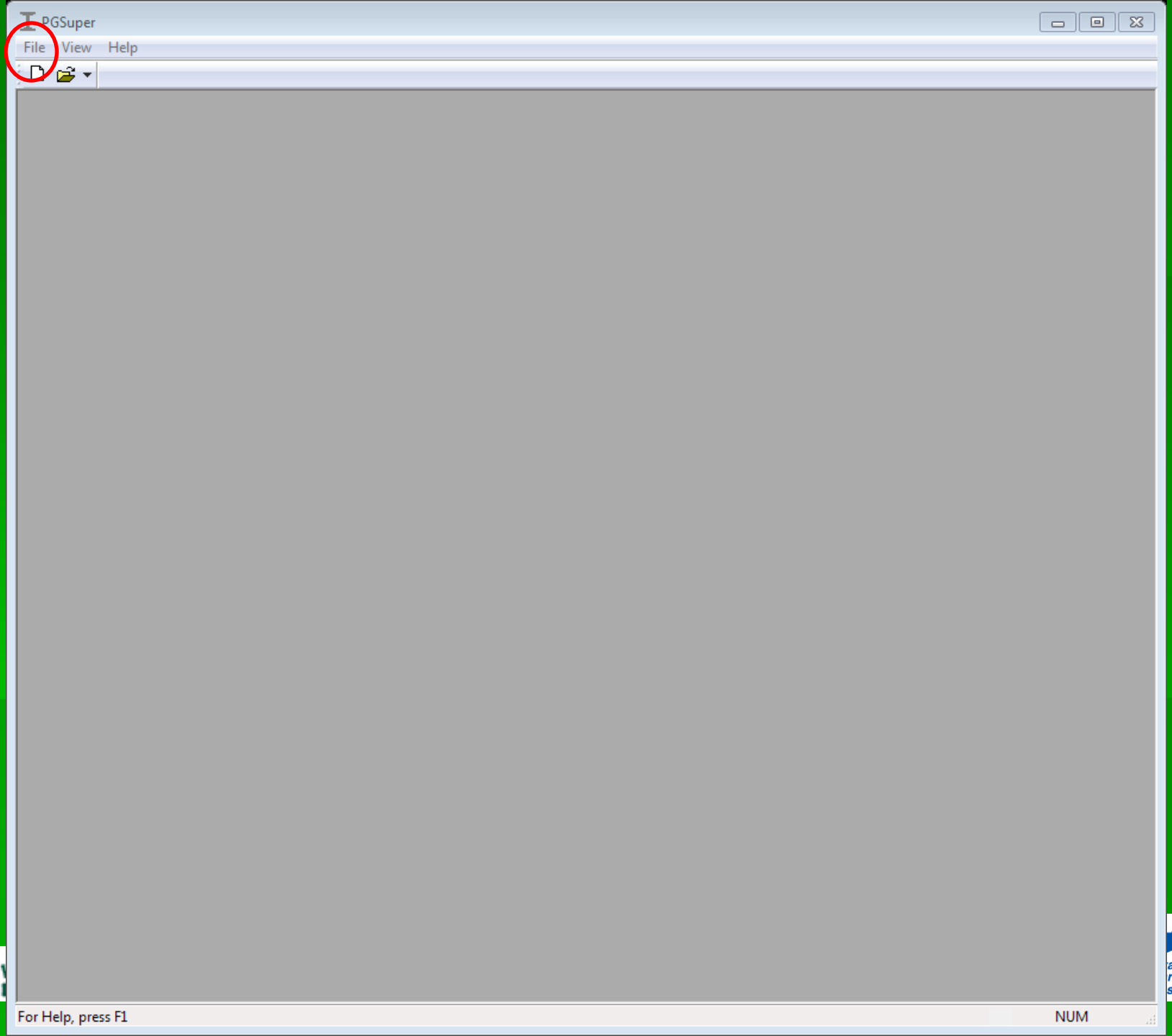
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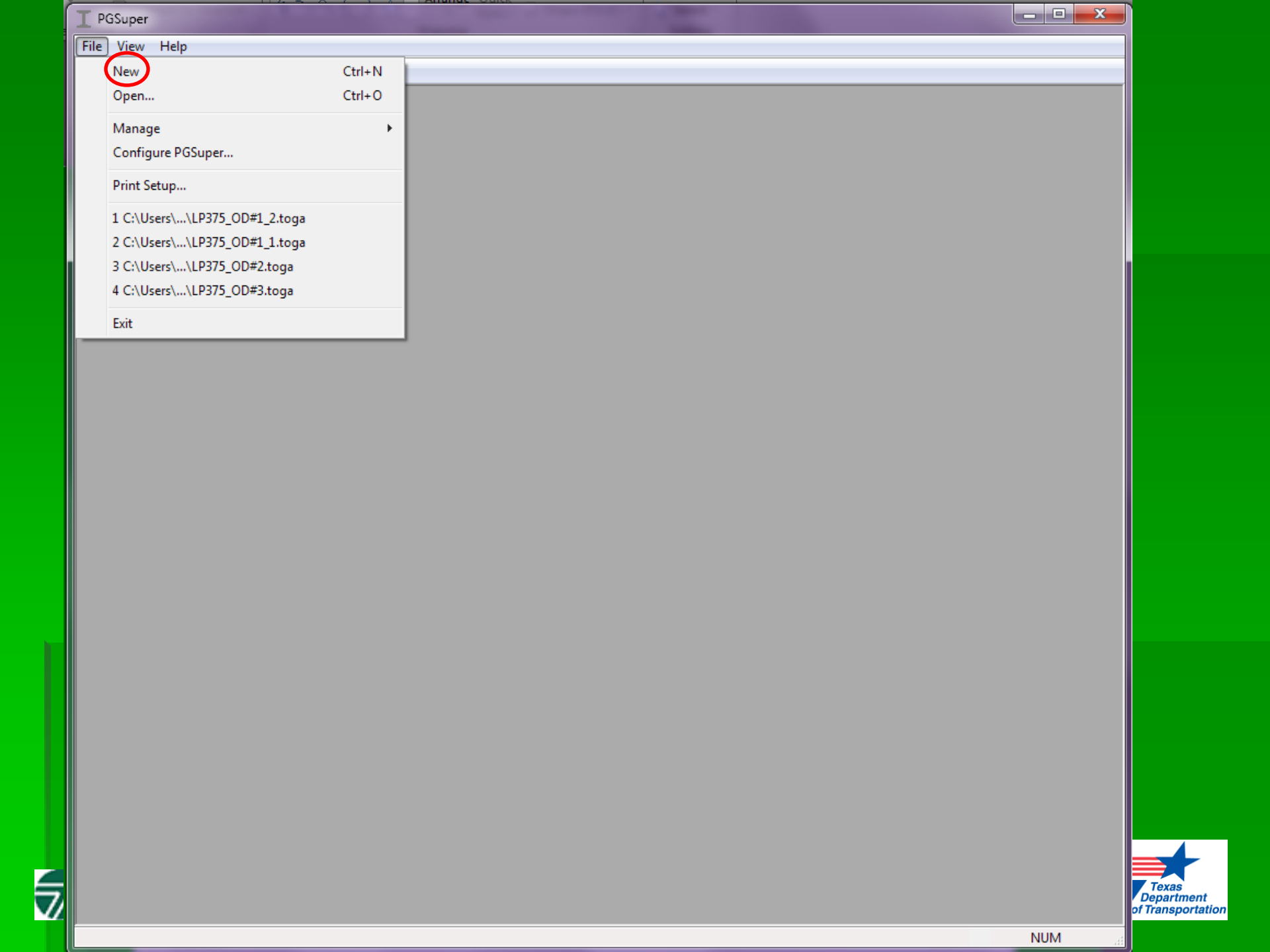
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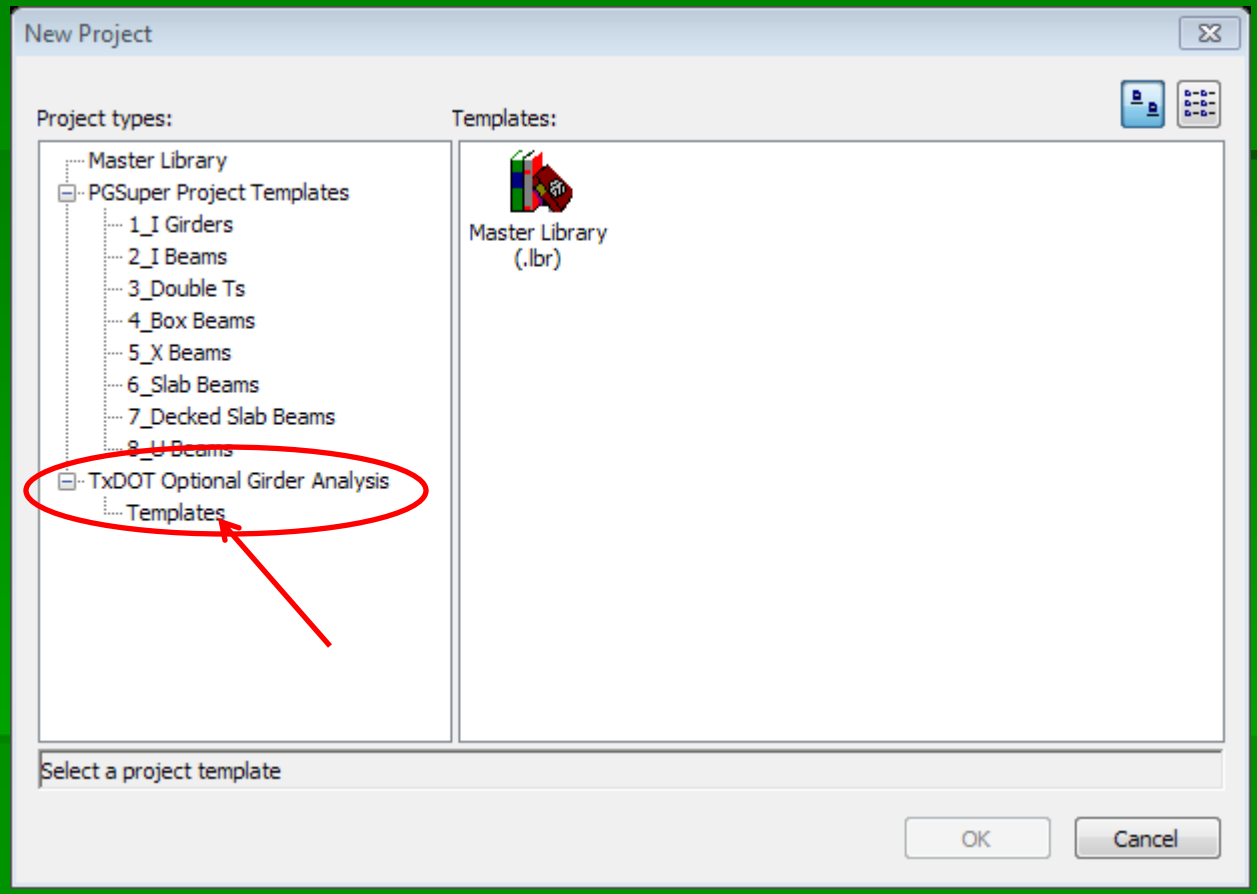

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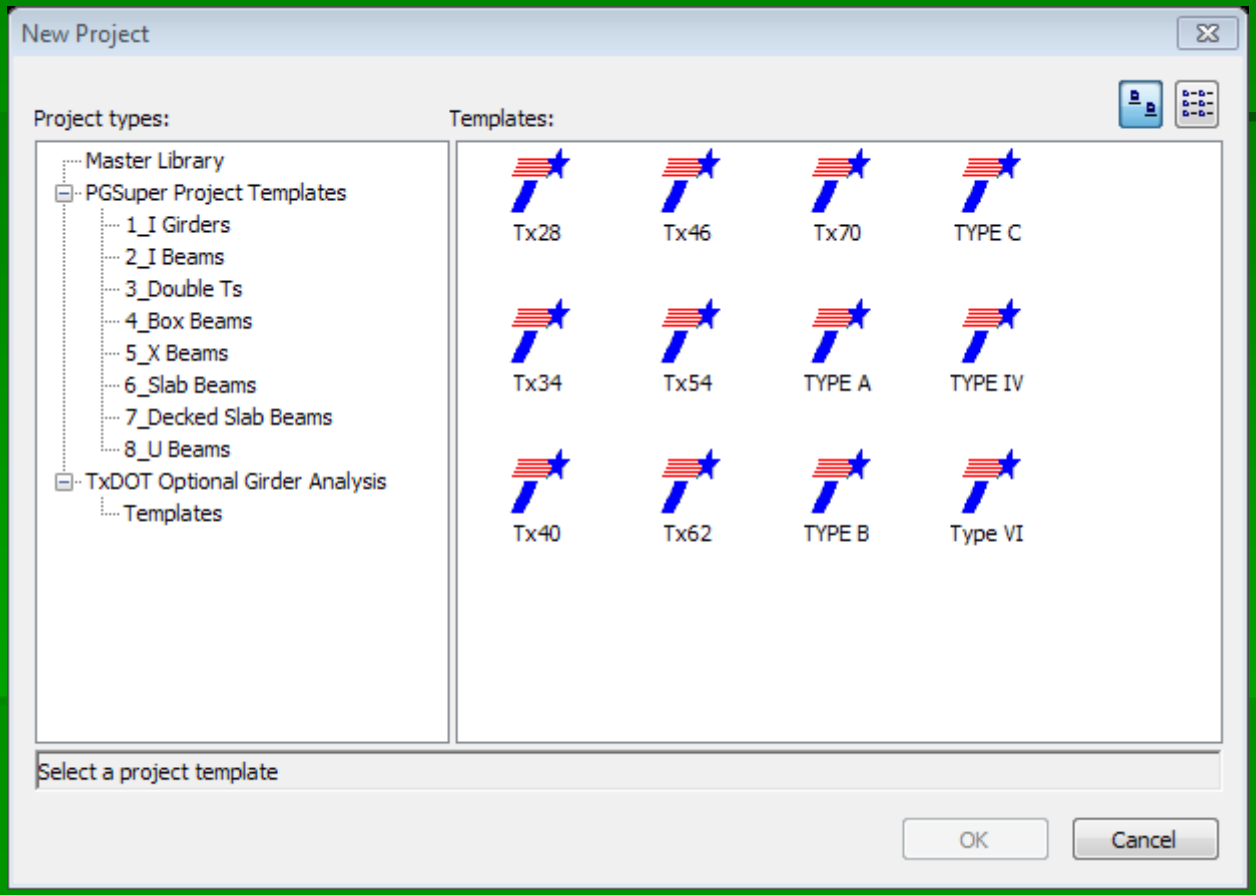

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STRUCTURE	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STD STRAND PATTERN	PRESTRESSING STRANDS							CONCRETE		OPTIONAL DESIGN				
					TOTAL NO.	SIZE (in)	STRGTH fpu (ksi)	"e" @ (in)	"e" END (in)	DEPRESSED NO.	DEPRESSED TO (in)	RELEASE STRGTH ① f'ci (ksi)	MINIMUM 28 DAY COMP STRGTH f'c (ksi)	DESIGN LOAD COMP STRESS (TOP @ (SERVICE I)) fgt (ksi)	DESIGN LOAD TENSILE STRESS (BOTT @ (SERVICE III)) fgb (ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (STRENGTH I) (ft-kips)	LIVE LOAD DISTRIBUTION FACTOR ② Moment	LIVE LOAD DISTRIBUTION FACTOR ② Shear
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	④	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400	4.549	-4.394	6639	0.528	0.634
	2	ALL	Tx46	⑤	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100	4.399	-4.255	6443	0.528	0.634
	3-6 & 16-20	ALL	Tx54		60	½	270	17.61	10.94	10	50.5	5.400	6.100	3.906	-3.944	7752	0.591	0.767
	7-8 & 12-13	ALL	Tx54		22	½	270	20.28	19.19	4	10.5	4.000	5.000	1.829	-1.948	4110	0.656	0.767
	14	ALL	Tx54		30	½	270	19.81	17.41	6	18.5	4.000	5.000	2.345	-2.479	5200	0.688	0.767
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SOUTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	④	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400	4.549	-4.394	6639	0.528	0.634
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	3-8 & 16-18	ALL	Tx54		60	½	270	17.61	10.94	10	50.5	5.400	6.100	3.906	-3.945	7754	0.591	0.767
	9&14	ALL	Tx54		30	½	270	19.81	17.41	6	18.5	4.000	5.000	2.384	-2.490	5122	0.633	0.767
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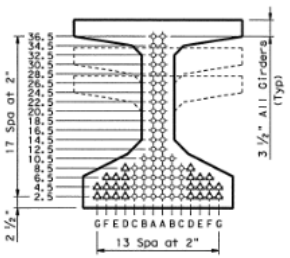
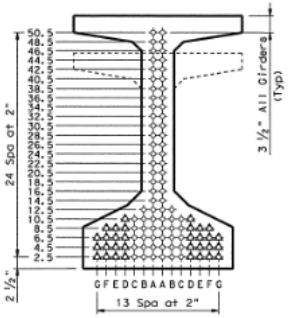
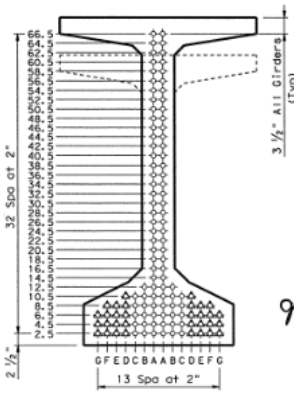


TYPE Tx28, Tx34 & Tx40③



TYPE Tx46 & Tx54③



TYPE Tx62 & Tx70③

NON-STANDARD STRAND PATTERNS	
PATTERN	STRAND ARRANGEMENT AT ℄ OF GIRDER
④	A(2.5, 4.5, 6.5, 8.5, 10.5, 12.5)
	B(2.5, 4.5, 6.5, 8.5, 10.5, 12.5)
	C(2.5, 4.5, 6.5, 8.5, 10.5)
	D(2.5, 4.5, 6.5, 8.5, 10.5)
	E(2.5, 4.5)
⑤	A(2.5, 4.5, 6.5, 8.5, 10.5)
	B(2.5, 4.5, 6.5, 8.5, 10.5)
	C(2.5, 4.5, 6.5, 8.5, 10.5)
	D(2.5, 4.5, 6.5, 8.5, 10.5)
	E(2.5, 4.5)

GENERAL NOTES:

Designed in accordance with AASHTO LRFD Specifications.

All concrete must be Class H. Provide Class H(HPC) if shown elsewhere in plans. All reinforcing bars must be Grade 60.

When shown on this sheet, the Fabricator has the option of furnishing either the designed depressed strand girder or an approved optional design. All optional design submittals must be signed, sealed and dated by a registered Professional Engineer.

Optional designs for girders 120 feet or longer must have a calculated residual camber equal to or greater than that of the designed girder.

Prestress losses for the designed girders have been calculated for a relative humidity of 60 percent. Optional designs must likewise conform.

For depressed strand designed girders, strands must be located as low as possible on the 2" grid system unless a Non-Standard Strand Pattern is indicated. Fill row "2.5", then row "4.5", then row "6.5", etc., beginning each row in the "A" position and working outward until the required number of strands is reached. All strands in the "A" position must be depressed, maintaining the 2" spacing so that, at the girder ends, the upper two strands are in the position shown in the table.

Strands for the designed girder must be low relaxation strands pretensioned to 75 percent of fpu each.

Seal cracks in girder ends exceeding 0.005" in width as directed by the Engineer. The fabricator is permitted to decrease the spacing of Bars R and S by providing additional bars to help limit crack width provided the decreased spacing results in no less than 1" clear between bars. The fabricator must take an approved corrective action if cracks greater than 0.005" form on a repetitive basis.

① Based on the following allowable stresses (ksi):

Compression = 0.65 f'ci

Tension = $0.24\sqrt{f'ci}$

Optional designs must likewise conform.

② Portion of full HL93.

③ Full-length debonded strands are only permitted in strand positions marked Δ. Double wrap full-length debonded strands in outermost position of each row. Full-length debonding must comply with Item 426.4.F.4.

HL93 LOADING

STATE OF TEXAS
NICHOLAS NEMEC
102288
LICENSED
PROFESSIONAL ENGINEER

Nicholas Nemec
3/24/2011

Texas Department of Transportation
Bridge Division

PRESTRESSED CONCRETE I-GIRDER DESIGNS (NON-STANDARD SPANS)

IGND

FILE:	lgndstd.dgn	DN: JMH	CK: TxDOT	DW: JTR	CK: TxDOT
©TxDOT	June 2007	DISTRICT		FEDERAL AID PROJECT	SHEET
REVISIONS 02/05h General Notes. 10/05h General Notes. 12/15h Rel Strgth & LLDF.		ELP			446
		COUNTY	CONTROL	SECT	JOB	HIGHWAY
		EL PASO	2592	03	034	LP 375

Revised 03-23-11

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STRUCTURE	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STD STRAND PATTERN	DESIGNED GIRDERS (DEPRESSED STRANDS) PRESTRESSING STRANDS TOTAL NO.	SIZE (in)	STRGTH fpu (ksi)	"e" @ (in)	"e" END (in)	DEPRESSED NO.	DEPRESSED TO (in)	CONCRETE RELEASE STRGTH (1) f'ci (ksi)	CONCRETE MINIMUM 28 DAY COMP STRGTH f'c (ksi)	OPTIONAL DESIGN DESIGN LOAD COMP STRESS (TOP @) (SERVICE I) fct (ksi)	DESIGN LOAD TENSILE STRESS (BOTT @) (SERVICE III) fcb (ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (STRENGTH I) (ft-kips)	LIVE LOAD DISTRIBUTION FACTOR (2) Moment	LIVE LOAD DISTRIBUTION FACTOR (2) Shear
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	(4)	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400	4.549	-4.394	6639	0.528	0.634
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NON-STANDARD STRAND PATTERNS

PATTERN	STRAND ARRANGEMENT AT ℄ OF GIRDER
(4)	A(2.5, 4.5, 6.5, 8.5, 10.5, 12.5)
	B(2.5, 4.5, 6.5, 8.5, 10.5, 12.5)
	C(2.5, 4.5, 6.5, 8.5, 10.5)
	D(2.5, 4.5, 6.5, 8.5, 10.5)
	E(2.5, 4.5)
(5)	A(2.5, 4.5, 6.5, 8.5, 10.5)

Texas Department of Transportation
Bridge Division

PRESTRESSED CONCRETE I-GIRDER DESIGNS (NON-STANDARD SPANS)

IGND

Nicholas Nemec 3/24/2011

Revised 03-23-11

TYPE Tx62 & Tx70(3)

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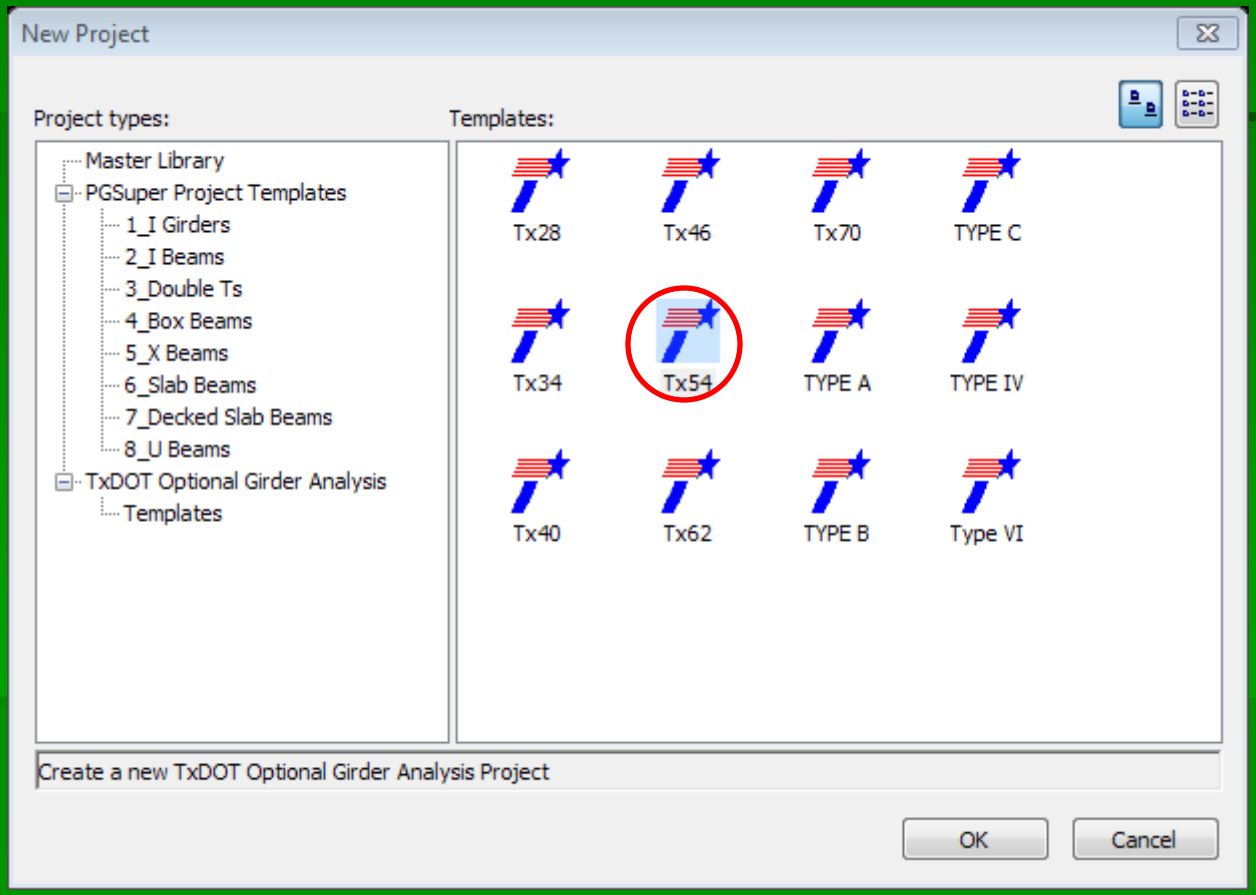

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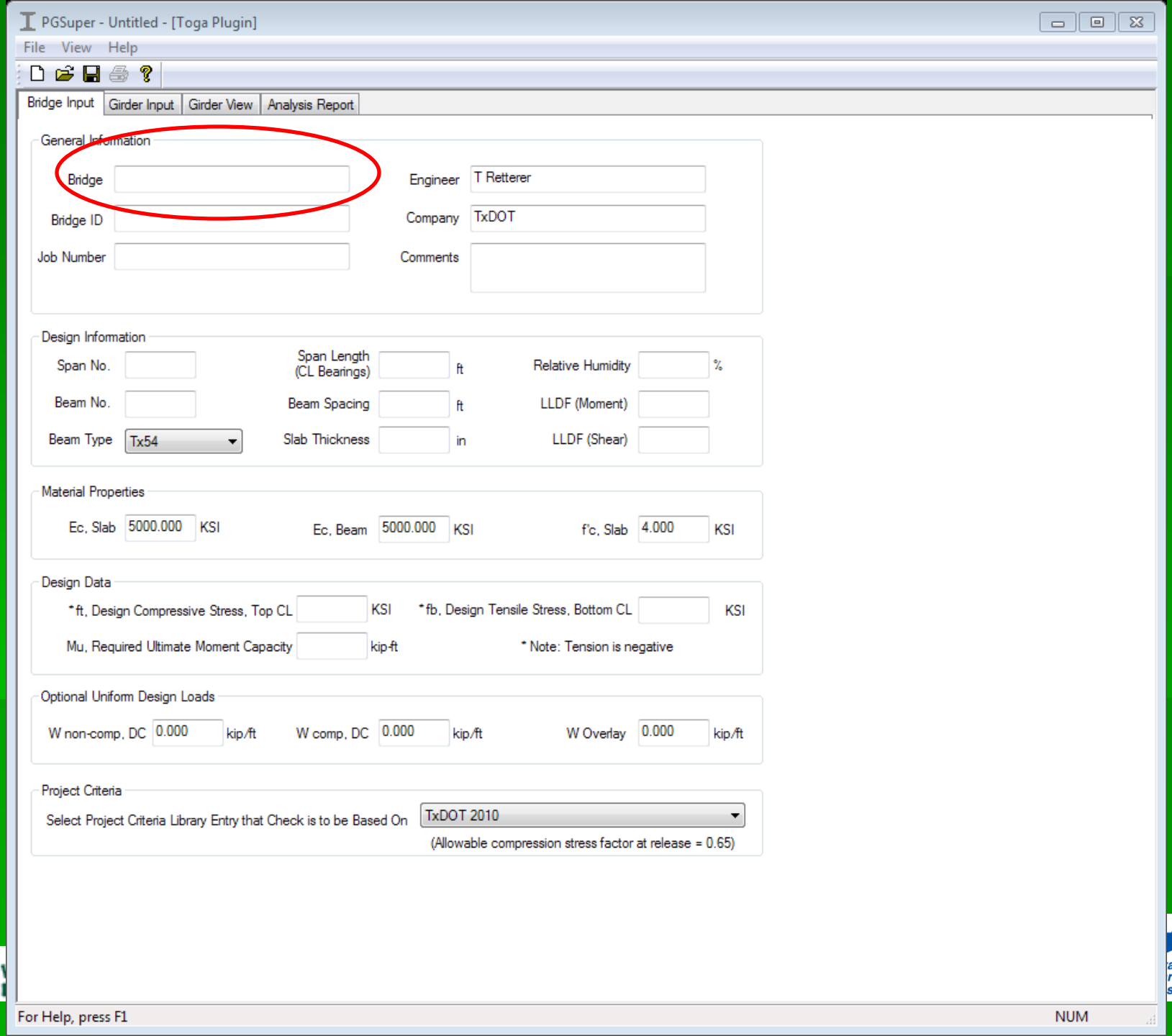
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Bridge
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Job Number
Engineer
T Retterer
Company
TxDOT
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Beam No.
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Beam Spacing
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Slab Thickness
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Relative Humidity
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LLDF (Shear)
Material Properties
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KSI
*fb, Design Tensile Stress, Bottom CL
KSI
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kip-ft
* Note: Tension is negative
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kip/ft
W comp, DC
0.000
kip/ft
W Overlay
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TxDOT 2010
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DESIGNED GIRDERS (DEPRESSED STRANDS)

STRUCTURE	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STD STRAND PATTERN	PRESTRESSING STRANDS: TOTAL NO.	SIZE (in)	STRGTH fpu (ksi)	"e" @ (in)	"e" END (in)	DEPRESSED NO.	DEPRESSED TO (in)	CONCRETE: RELEASE STRGTH (1) f'ci (ksi)	CONCRETE: MINIMUM 28 DAY COMP STRGTH f'c (ksi)	OPTIONAL DESIGN: DESIGN LOAD COMP STRESS (TOP @ (SERVICE I)) fgt (ksi)	DESIGN LOAD TENSILE STRESS (BOTT @ (SERVICE III)) fgb (ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (STRENGTH I) (ft-kips)	LIVE LOAD DISTRIBUTION FACTOR (2): Moment	LIVE LOAD DISTRIBUTION FACTOR (2): Shear
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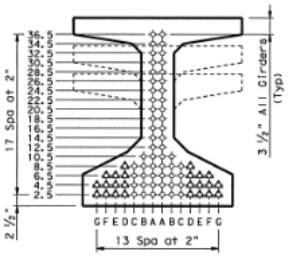

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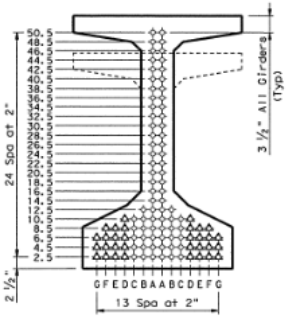

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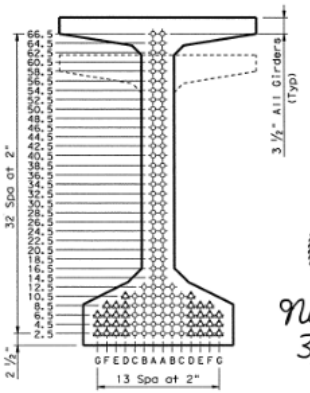

TYPE Tx62 & Tx70 (3)

NON-STANDARD STRAND PATTERNS

PATTERN	STRAND ARRANGEMENT AT ℄ OF GIRDER
(4)	A(2.5, 4.5, 6.5, 8.5, 10.5, 12.5)
	B(2.5, 4.5, 6.5, 8.5, 10.5, 12.5)
	C(2.5, 4.5, 6.5, 8.5, 10.5)
	D(2.5, 4.5, 6.5, 8.5, 10.5)
	E(2.5, 4.5)
(5)	A(2.5, 4.5, 6.5, 8.5, 10.5)
	B(2.5, 4.5, 6.5, 8.5, 10.5)
	C(2.5, 4.5, 6.5, 8.5, 10.5)
	D(2.5, 4.5, 6.5, 8.5, 10.5)
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GENERAL NOTES:

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All concrete must be Class H. Provide Class H(HPC) if shown elsewhere in plans. All reinforcing bars must be Grade 60.

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(1) Based on the following allowable stresses (ksi):

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Tension = $0.24\sqrt{f'ci}$

Optional designs must likewise conform.

(2) Portion of full HL93.

(3) Full-length debonded strands are only permitted in strand positions marked Δ. Double wrap full-length debonded strands in outermost position of each row. Full-length debonding must comply with Item 426.4.F.4.

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STATE OF TEXAS
NICHOLAS NEMEC
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FILE:	lgndstd.dgn	DN: JMH	CK: TxDOT	DW: JTR	CK: TxDOT
©TxDOT	June 2007	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS 02/05 General Notes. 10/05 General Notes. 12/10 Rel Strgth & LLDF.		ELP			446
		COUNTY	CONTROL	SECT	JOB	HIGHWAY
		EL PASO	2592	03	034	LP 375

Revised 03-23-11

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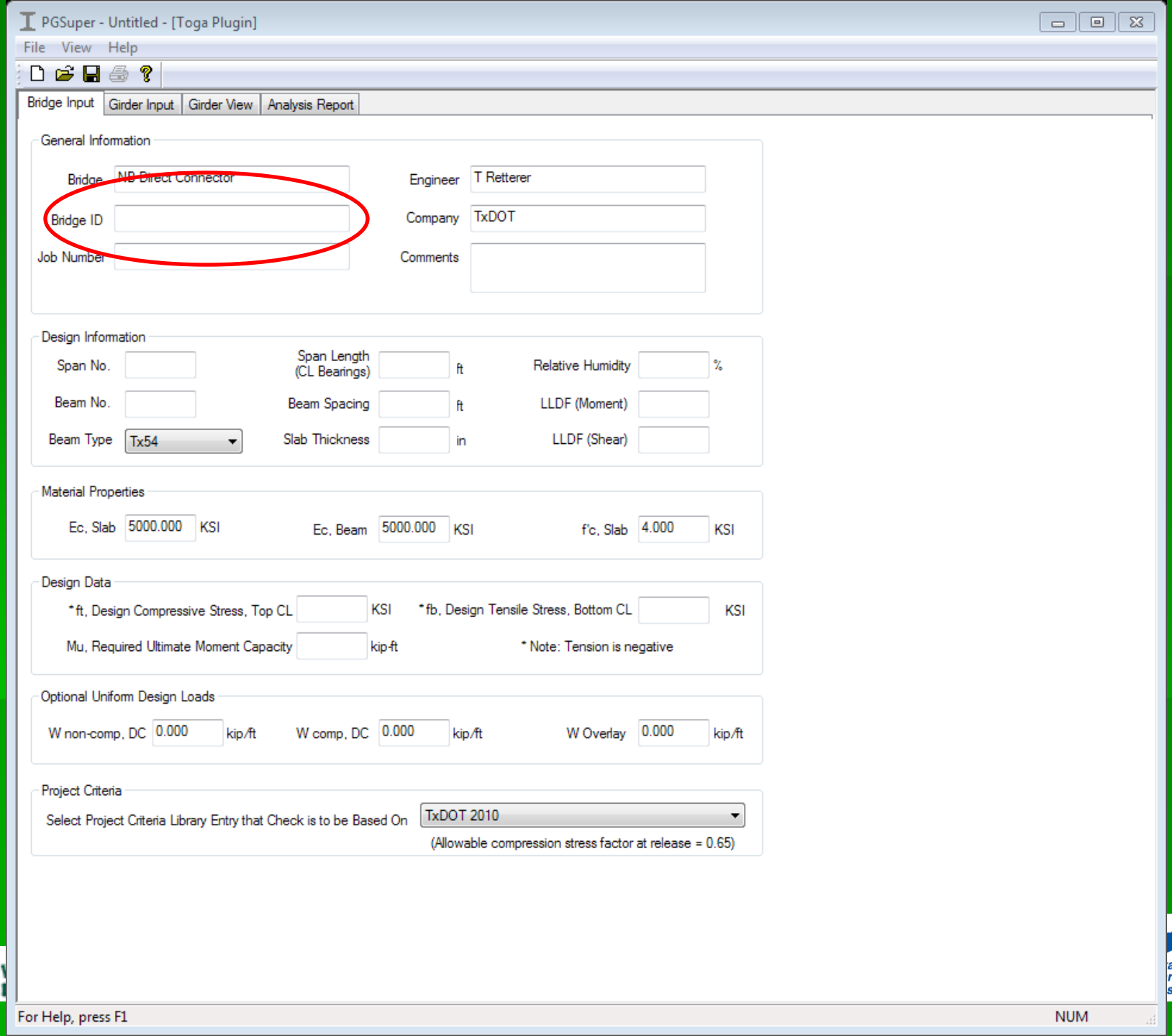
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Bridge Input
Girder Input
Girder View
Analysis Report
General Information
Bridge
NB Direct Connector
Bridge ID
Job Number
Engineer
T Retterer
Company
TxDOT
Comments
Design Information
Span No.
Beam No.
Beam Type
Tx54
Span Length (CL Bearings)
ft
Beam Spacing
ft
Slab Thickness
in
Relative Humidity
%
LLDF (Moment)
LLDF (Shear)
Material Properties
Ec, Slab
5000.000
KSI
Ec, Beam
5000.000
KSI
f'c, Slab
4.000
KSI
Design Data
*ft, Design Compressive Stress, Top CL
KSI
*fb, Design Tensile Stress, Bottom CL
KSI
Mu, Required Ultimate Moment Capacity
kip-ft
* Note: Tension is negative
Optional Uniform Design Loads
W non-comp, DC
0.000
kip/ft
W comp, DC
0.000
kip/ft
W Overlay
0.000
kip/ft
Project Criteria
Select Project Criteria Library Entry that Check is to be Based On
TxDOT 2010
(Allowable compression stress factor at release = 0.65)
For Help, press F1
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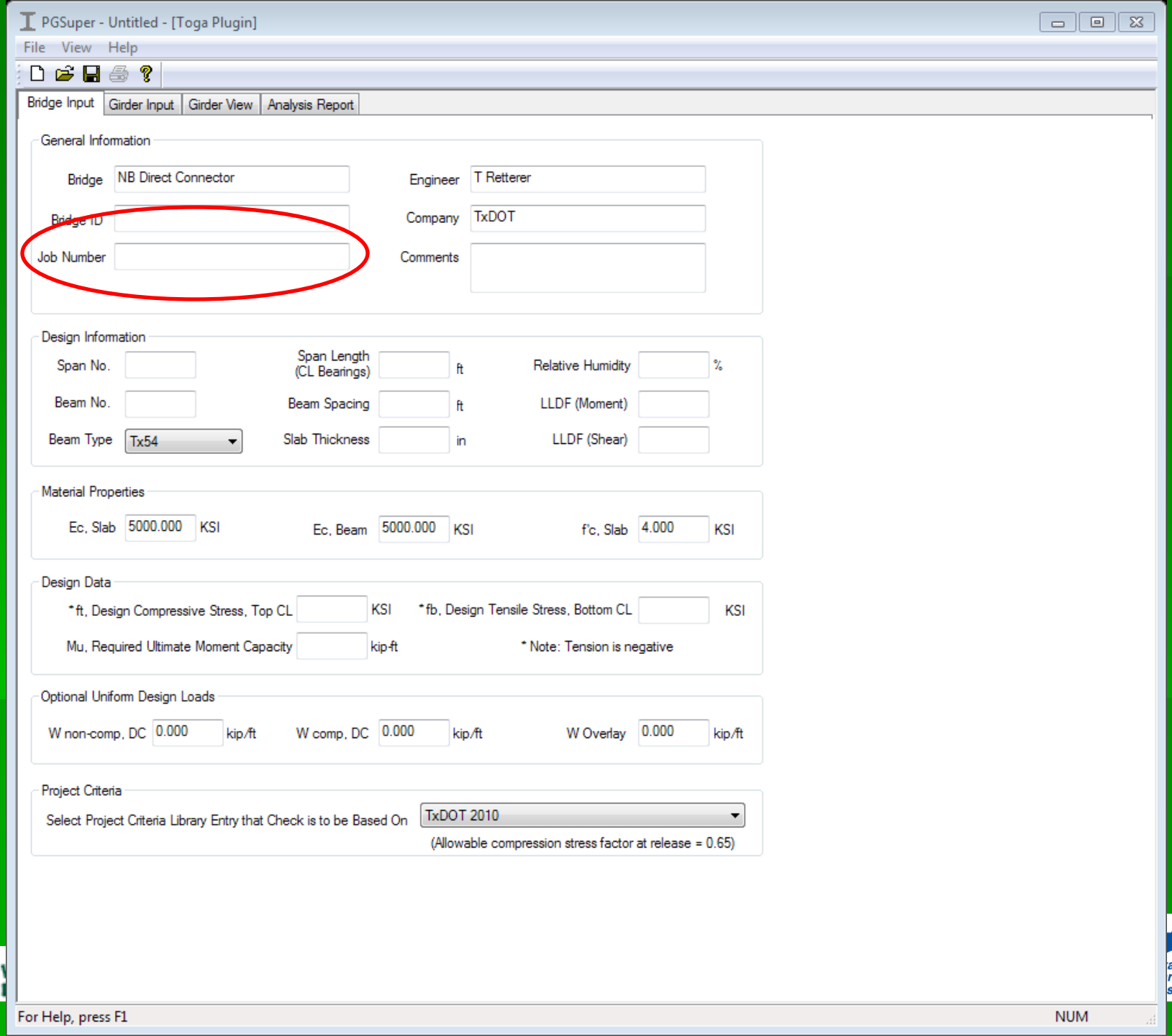
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Girder View
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NB Direct Connector
Engineer
T Retterer
Bridge ID
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Job Number
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Span Length (CL Bearings)
ft
Relative Humidity
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Beam Spacing
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LLDF (Moment)
Beam Type
Tx54
Slab Thickness
in
LLDF (Shear)
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KSI
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kip/ft
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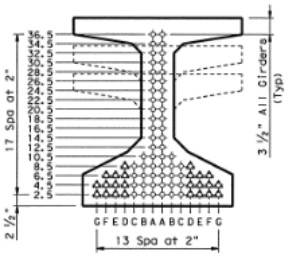
0.000
kip/ft
W Overlay
0.000
kip/ft
Project Criteria
Select Project Criteria Library Entry that Check is to be Based On
TxDOT 2010
(Allowable compression stress factor at release = 0.65)
For Help, press F1
NUM

DESIGNED GIRDERS (DEPRESSED STRANDS)

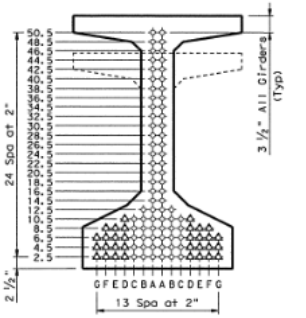
STRUCTURE	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STD STRAND PATTERN	PRESTRESSING STRANDS: TOTAL NO.	SIZE (in)	STRGTH fpu (ksi)	"e" @ (in)	"e" END (in)	DEPRESSED NO.	DEPRESSED TO (in)	CONCRETE: RELEASE STRGTH (1) f'ci (ksi)	CONCRETE: MINIMUM 28 DAY COMP STRGTH f'c (ksi)
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	(4)	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400
	2	ALL	Tx46	(5)	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100
	3-6 & 16-20	ALL	Tx54		60	½	270	17.61	10.94	10	50.5	5.400	6.100
	7-8 & 12-13	ALL	Tx54		22	½	270	20.28	19.19	4	10.5	4.000	5.000
	14	ALL	Tx54		30	½	270	19.81	17.41	6	18.5	4.000	5.000
	15	ALL	Tx54		66	½	270	17.07	10.52	12	48.5	5.800	6.400
	21	ALL	Tx54		62	½	270	17.46	11.01	10	50.5	5.600	6.300
SOUTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	(4)	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400
	2	ALL	Tx46	(5)	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100
	3-8 & 16-18	ALL	Tx54		60	½	270	17.61	10.94	10	50.5	5.400	6.100
	9&14	ALL	Tx54		30	½	270	19.81	17.41	6	18.5	4.000	5.000
	13	ALL	Tx54		34	½	270	19.48	16.65	6	22.5	4.000	5.000
	15	ALL	Tx54		68	½	270	16.83	9.42	14	50.5	5.800	6.400
	19	ALL	Tx54		62	½	270	17.46	11.01	10	50.5	5.600	6.300

OPTIONAL DESIGN

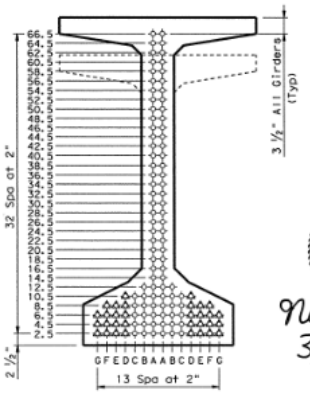
STRUCTURE	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STD STRAND PATTERN	DESIGN LOAD COMP STRESS (TOP ℄) (SERVICE I) fct (ksi)	DESIGN LOAD TENSILE STRESS (BOTT ℄) (SERVICE III) fcb (ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (STRENGTH I) (ft-kips)	LIVE LOAD DISTRIBUTION FACTOR (2) Moment	LIVE LOAD DISTRIBUTION FACTOR (2) Shear
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	(4)	4.549	-4.394	6639	0.528	0.634
	2	ALL	Tx46	(5)	4.399	-4.255	6443	0.528	0.634
	3-6 & 16-20	ALL	Tx54		3.906	-3.944	7752	0.591	0.767
	7-8 & 12-13	ALL	Tx54		1.829	-1.948	4110	0.656	0.767
	14	ALL	Tx54		2.345	-2.479	5200	0.688	0.767
	15	ALL	Tx54		4.008	-4.128	8367	0.688	0.767
	21	ALL	Tx54		4.026	-4.058	7954	0.588	0.767
SOUTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	(4)	4.549	-4.394	6639	0.528	0.634
	2	ALL	Tx46	(5)	4.399	-4.255	6443	0.528	0.634
	3-8 & 16-18	ALL	Tx54		3.906	-3.945	7754	0.591	0.767
	9&14	ALL	Tx54		2.384	-2.490	5122	0.633	0.767
	13	ALL	Tx54		2.583	-2.682	5474	0.625	0.767
	15	ALL	Tx54		4.068	-4.211	8594	0.718	0.767
	19	ALL	Tx54		4.026	-4.059	7956	0.588	0.767



TYPE Tx28, Tx34 & Tx40 (3)



TYPE Tx46 & Tx54 (3)



TYPE Tx62 & Tx70 (3)

NON-STANDARD STRAND PATTERNS

PATTERN	STRAND ARRANGEMENT AT ℄ OF GIRDER
(4)	A(2.5, 4.5, 6.5, 8.5, 10.5, 12.5)
	B(2.5, 4.5, 6.5, 8.5, 10.5, 12.5)
	C(2.5, 4.5, 6.5, 8.5, 10.5)
	D(2.5, 4.5, 6.5, 8.5, 10.5)
	E(2.5, 4.5)
(5)	A(2.5, 4.5, 6.5, 8.5, 10.5)
	B(2.5, 4.5, 6.5, 8.5, 10.5)
	C(2.5, 4.5, 6.5, 8.5, 10.5)
	D(2.5, 4.5, 6.5, 8.5, 10.5)
	E(2.5, 4.5)

GENERAL NOTES:

Designed in accordance with AASHTO LRFD Specifications.

All concrete must be Class H. Provide Class H(HPC) if shown elsewhere in plans. All reinforcing bars must be Grade 60.

When shown on this sheet, the Fabricator has the option of furnishing either the designed depressed strand girder or an approved optional design. All optional design submittals must be signed, sealed and dated by a registered Professional Engineer.

Optional designs for girders 120 feet or longer must have a calculated residual camber equal to or greater than that of the designed girder.

Prestress losses for the designed girders have been calculated for a relative humidity of 60 percent. Optional designs must likewise conform.

For depressed strand designed girders, strands must be located as low as possible on the 2" grid system unless a Non-Standard Strand Pattern is indicated. Fill row "2.5", then row "4.5", then row "6.5", etc., beginning each row in the "A" position and working outward until the required number of strands is reached. All strands in the "A" position must be depressed, maintaining the 2" spacing so that, at the girder ends, the upper two strands are in the position shown in the table.

Strands for the designed girder must be low relaxation strands pretensioned to 75 percent of fpu each.

Seal cracks in girder ends exceeding 0.005" in width as directed by the Engineer. The fabricator is permitted to decrease the spacing of Bars R and S by providing additional bars to help limit crack width provided the decreased spacing results in no less than 1" clear between bars. The fabricator must take an approved corrective action if cracks greater than 0.005" form on a repetitive basis.

(1) Based on the following allowable stresses (ksi):

Compression = 0.65 f'ci

Tension = $0.24\sqrt{f'ci}$

Optional designs must likewise conform.

(2) Portion of full HL93.

(3) Full-length debonded strands are only permitted in strand positions marked Δ. Double wrap full-length debonded strands in outermost position of each row. Full-length debonding must comply with Item 426.4.F.4.

HL93 LOADING

STATE OF TEXAS
NICHOLAS NEMEC
102288
LICENSED PROFESSIONAL ENGINEER

Nicholas Nemec
3/24/2011

Texas Department of Transportation
Bridge Division

PRESTRESSED CONCRETE I-GIRDER DESIGNS (NON-STANDARD SPANS)

IGND

FILE:	lgndstd.dgn	DN: JMH	CK: TxDOT	DW: JTR	CK: TxDOT
©TxDOT	June 2007	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS 02/05h General Notes. 10/05h General Notes. 12/10h Rel Strgth & LLDF.		ELP			446
		COUNTY	CONTROL	SECT	JOB
		EL PASO	2552	03	034

Revised 03-23-11

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Washington State Department of Transportation

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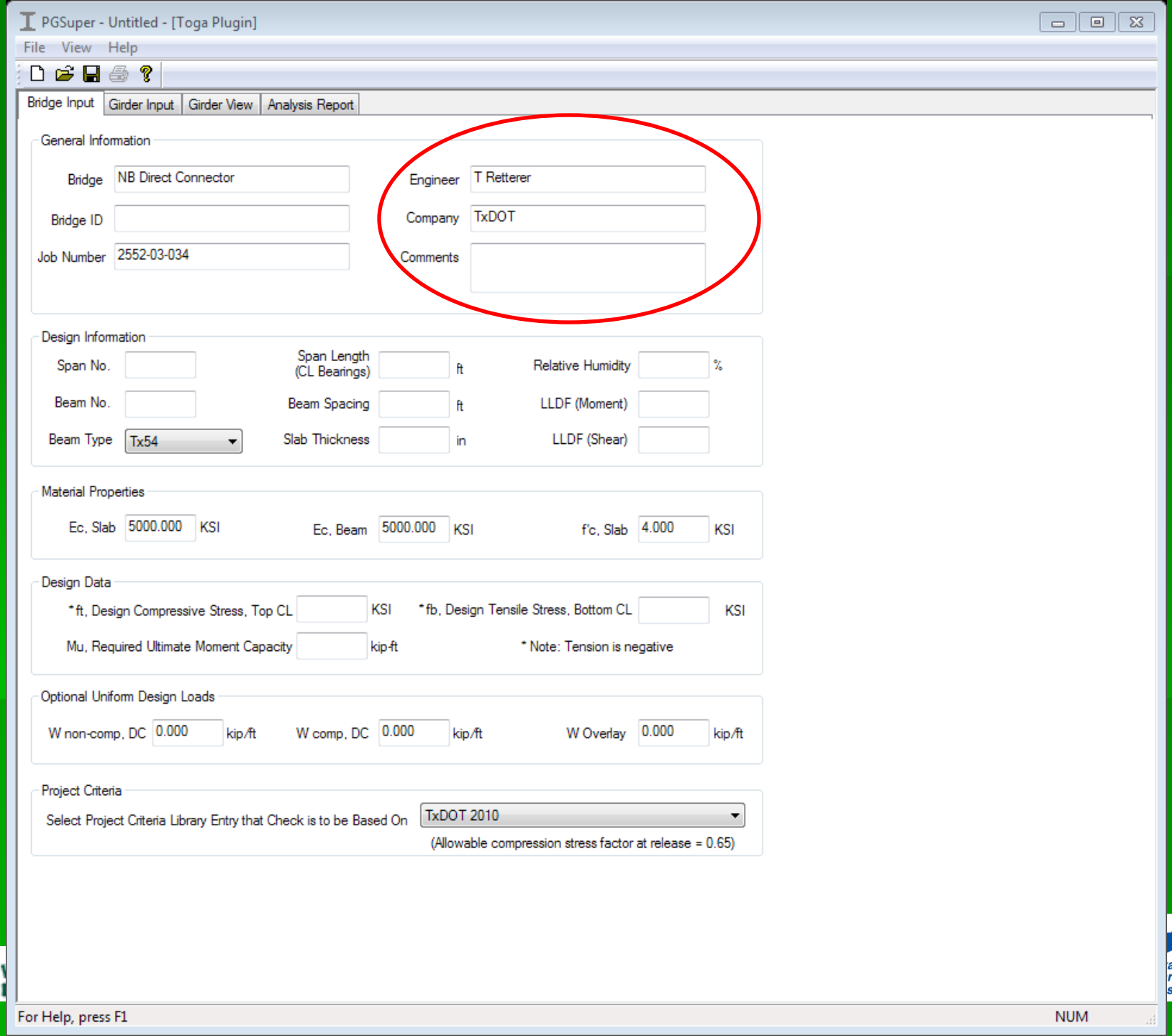
Texas Department of Transportation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Girder View
Analysis Report
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Bridge
NB Direct Connector
Bridge ID
Job Number
2552-03-034
Engineer
T Retterer
Company
TxDOT
Comments
Design Information
Span No.
Beam No.
Beam Type
Tx54
Span Length (CL Bearings)
ft
Beam Spacing
ft
Slab Thickness
in
Relative Humidity
%
LLDF (Moment)
LLDF (Shear)
Material Properties
Ec, Slab
5000.000
KSI
Ec, Beam
5000.000
KSI
f'c, Slab
4.000
KSI
Design Data
*ft, Design Compressive Stress, Top CL
KSI
*fb, Design Tensile Stress, Bottom CL
KSI
Mu, Required Ultimate Moment Capacity
kip-ft
* Note: Tension is negative
Optional Uniform Design Loads
W non-comp, DC
0.000
kip/ft
W comp, DC
0.000
kip/ft
W Overlay
0.000
kip/ft
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TxDOT 2010
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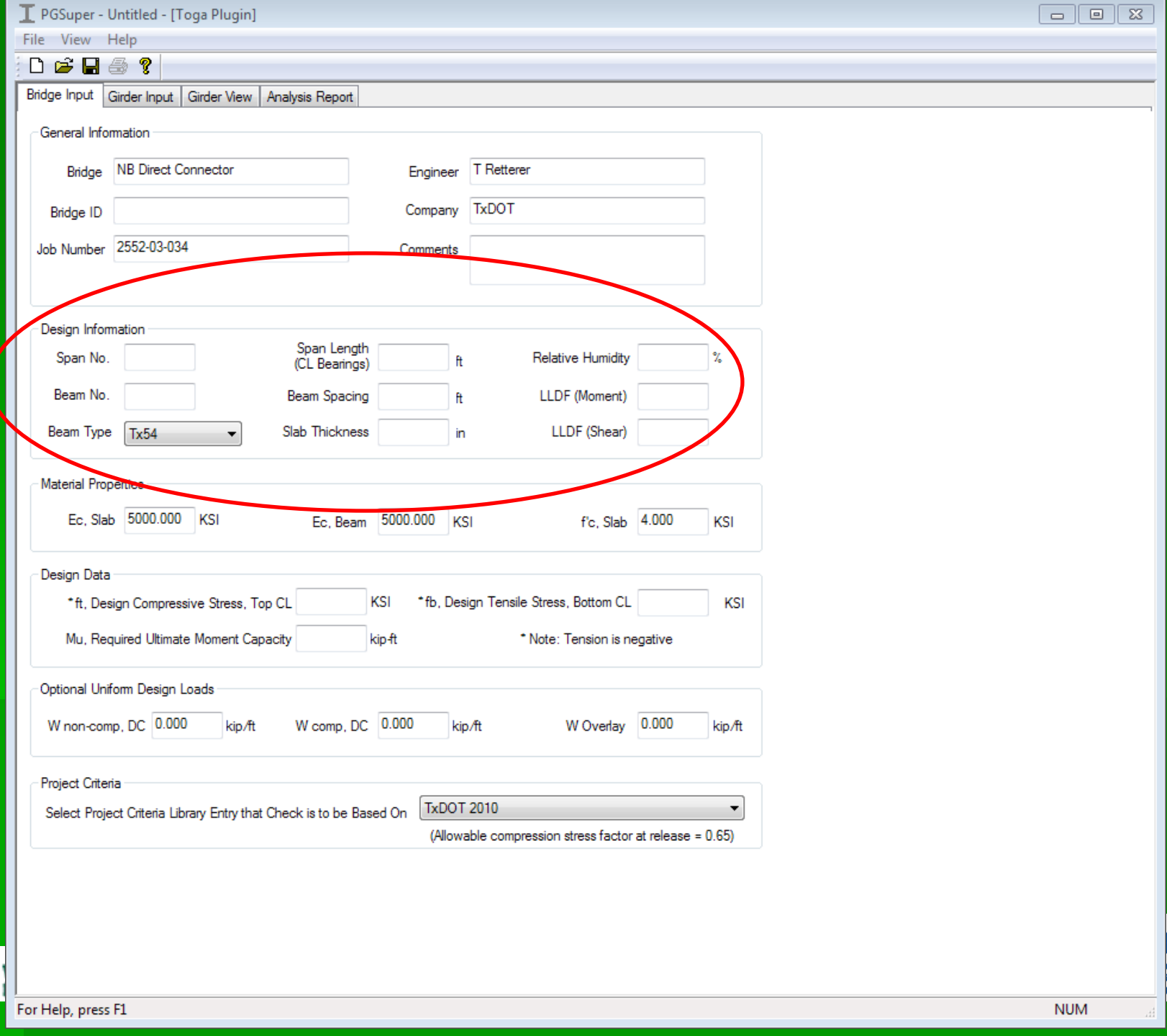
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Girder View
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NB Direct Connector
Engineer
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Bridge ID
Company
TxDOT
Job Number
2552-03-034
Comments
Design Information
Span No.
Span Length (CL Bearings)
ft
Relative Humidity
%
Beam No.
Beam Spacing
ft
LLDF (Moment)
Beam Type
Tx54
Slab Thickness
in
LLDF (Shear)
Material Properties
Ec, Slab
5000.000
KSI
Ec, Beam
5000.000
KSI
f'c, Slab
4.000
KSI
Design Data
*ft, Design Compressive Stress, Top CL
KSI
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Mu, Required Ultimate Moment Capacity
kip-ft
* Note: Tension is negative
Optional Uniform Design Loads
W non-comp, DC
0.000
kip/ft
W comp, DC
0.000
kip/ft
W Overlay
0.000
kip/ft
Project Criteria
Select Project Criteria Library Entry that Check is to be Based On
TxDOT 2010
(Allowable compression stress factor at release = 0.65)
For Help, press F1
NUM

DESIGNED GIRDERS (DEPRESSED STRANDS)

STRUCTURE	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STD STRAND PATTERN	PRESTRESSING STRANDS TOTAL NO.	PRESTRESSING STRANDS SIZE (in)	PRESTRESSING STRANDS STRGTH fpu (ksi)	PRESTRESSING STRANDS "e" ℄ (in)	PRESTRESSING STRANDS "e" END (in)	PRESTRESSING STRANDS DEPRESSED NO.	PRESTRESSING STRANDS DEPRESSED TO (in)	CONCRETE RELEASE STRGTH ① f'ci (ksi)	CONCRETE MINIMUM 28 DAY COMP STRGTH f'c (ksi)	OPTIONAL DESIGN DESIGN LOAD COMP STRESS (TOP ℄) (SERVICE I) fct (ksi)	OPTIONAL DESIGN DESIGN LOAD TENSILE STRESS (BOTT ℄) (SERVICE III) fcb (ksi)	OPTIONAL DESIGN REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (STRENGTH I) (ft-kips)	OPTIONAL DESIGN LIVE LOAD DISTRIBUTION FACTOR ② Moment	OPTIONAL DESIGN LIVE LOAD DISTRIBUTION FACTOR ② Shear
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	④	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400	4.549	-4.394	6639	0.528	0.634
	2	ALL	Tx46	⑤	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100	4.399	-4.255	6443	0.528	0.634
	3-6 & 16-20	ALL	Tx54		60	½	270	17.61	10.94	10	50.5	5.400	6.100	3.906	-3.944	7752	0.591	0.767
	7-8 & 12-13	ALL	Tx54		22	½	270	20.28	19.19	4	10.5	4.000	5.000	1.829	-1.948	4110	0.656	0.767
	14	ALL	Tx54		30	½	270	19.81	17.41	6	18.5	4.000	5.000	2.345	-2.479	5200	0.688	0.767
	15	ALL	Tx54		66	½	270	17.07	10.52	12	48.5	5.800	6.400	4.008	-4.128	8367	0.688	0.767
	21	ALL	Tx54		62	½	270	17.46	11.01	10	50.5	5.600	6.300	4.026	-4.058	7954	0.588	0.767

NON-STANDARD STRAND PATTERNS

PATTERN	STRAND ARRANGEMENT AT ℄ OF GIRDER
④	A(2.5, 4.5, 6.5, 8.5, 10.5, 12.5)
	B(2.5, 4.5, 6.5, 8.5, 10.5, 12.5)
	C(2.5, 4.5, 6.5, 8.5, 10.5)
	D(2.5, 4.5, 6.5, 8.5, 10.5)
	E(2.5, 4.5)
⑤	A(2.5, 4.5, 6.5, 8.5, 10.5)

TYPE Tx62 & Tx70③

Texas Department of Transportation
Bridge Division

PRESTRESSED CONCRETE I-GIRDER DESIGNS (NON-STANDARD SPANS)

IGND

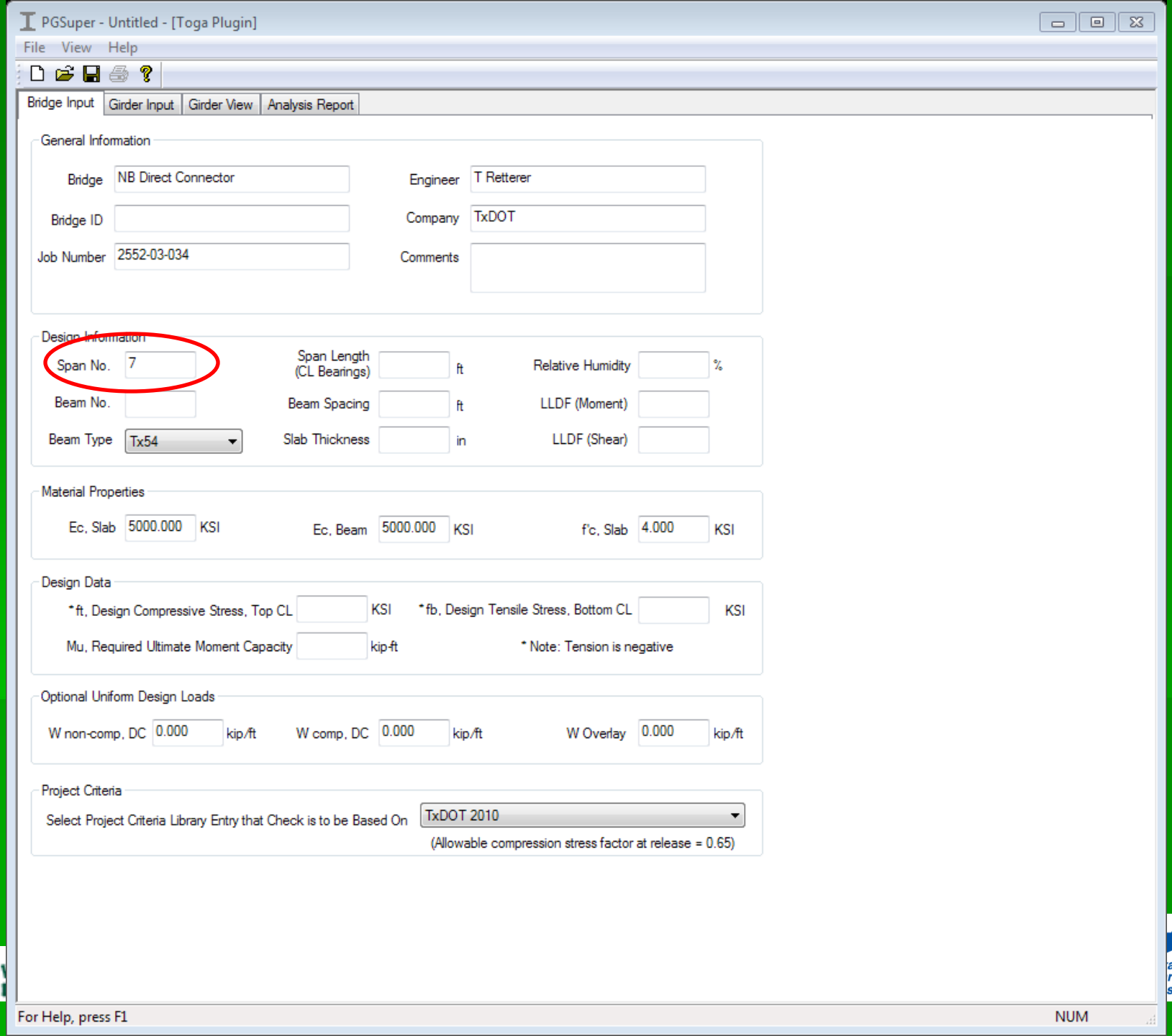
Nicholas Nemec 3/24/2011

Revised 03-23-11

Washington State Department of Transportation

PGSuper

Texas Department of Transportation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Girder Input
Girder View
Analysis Report
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Bridge
NB Direct Connector
Engineer
T Retterer
Bridge ID
Company
TxDOT
Job Number
2552-03-034
Comments
Design Information
Span No.
7
Span Length (CL Bearings)
ft
Relative Humidity
%
Beam No.
Beam Spacing
ft
LLDF (Moment)
Beam Type
Tx54
Slab Thickness
in
LLDF (Shear)
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Ec, Slab
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KSI
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* Note: Tension is negative
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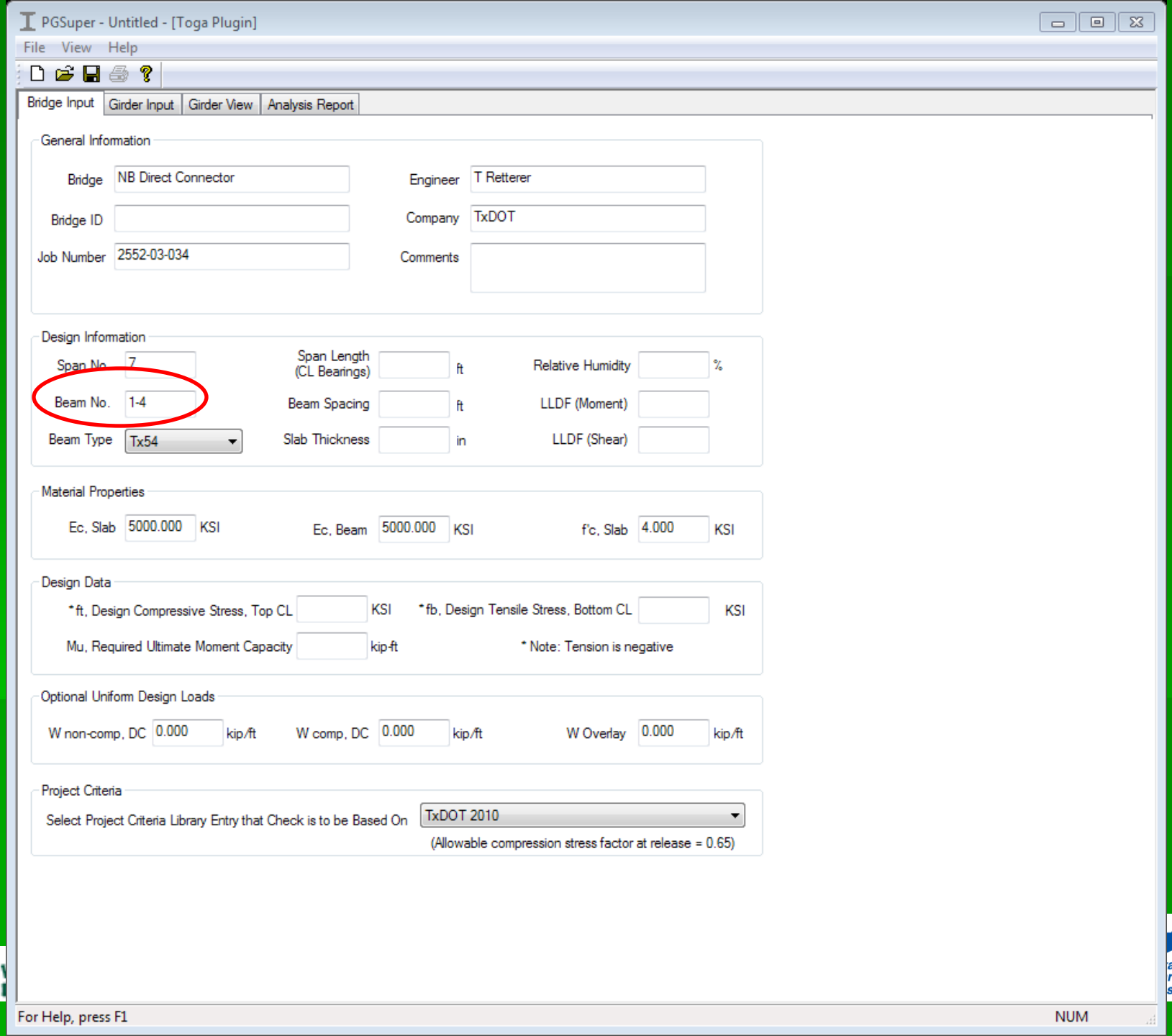
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Bridge ID
Company
TxDOT
Job Number
2552-03-034
Comments
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7
Span Length (CL Bearings)
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Relative Humidity
%
Beam No.
1-4
Beam Spacing
ft
LLDF (Moment)
Beam Type
Tx54
Slab Thickness
in
LLDF (Shear)
Material Properties
Ec, Slab
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f'c, Slab
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Design Data
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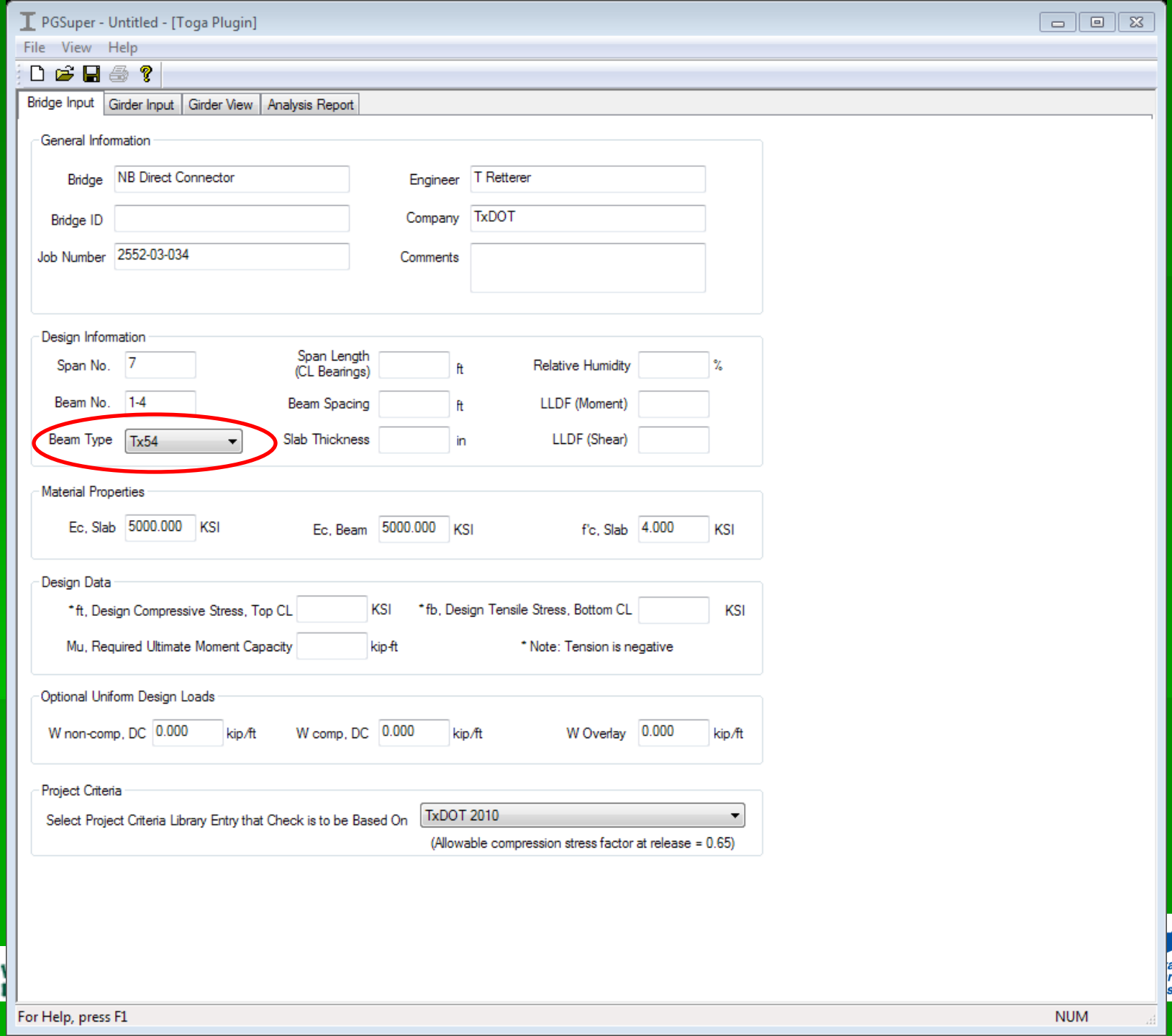
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ft
Relative Humidity
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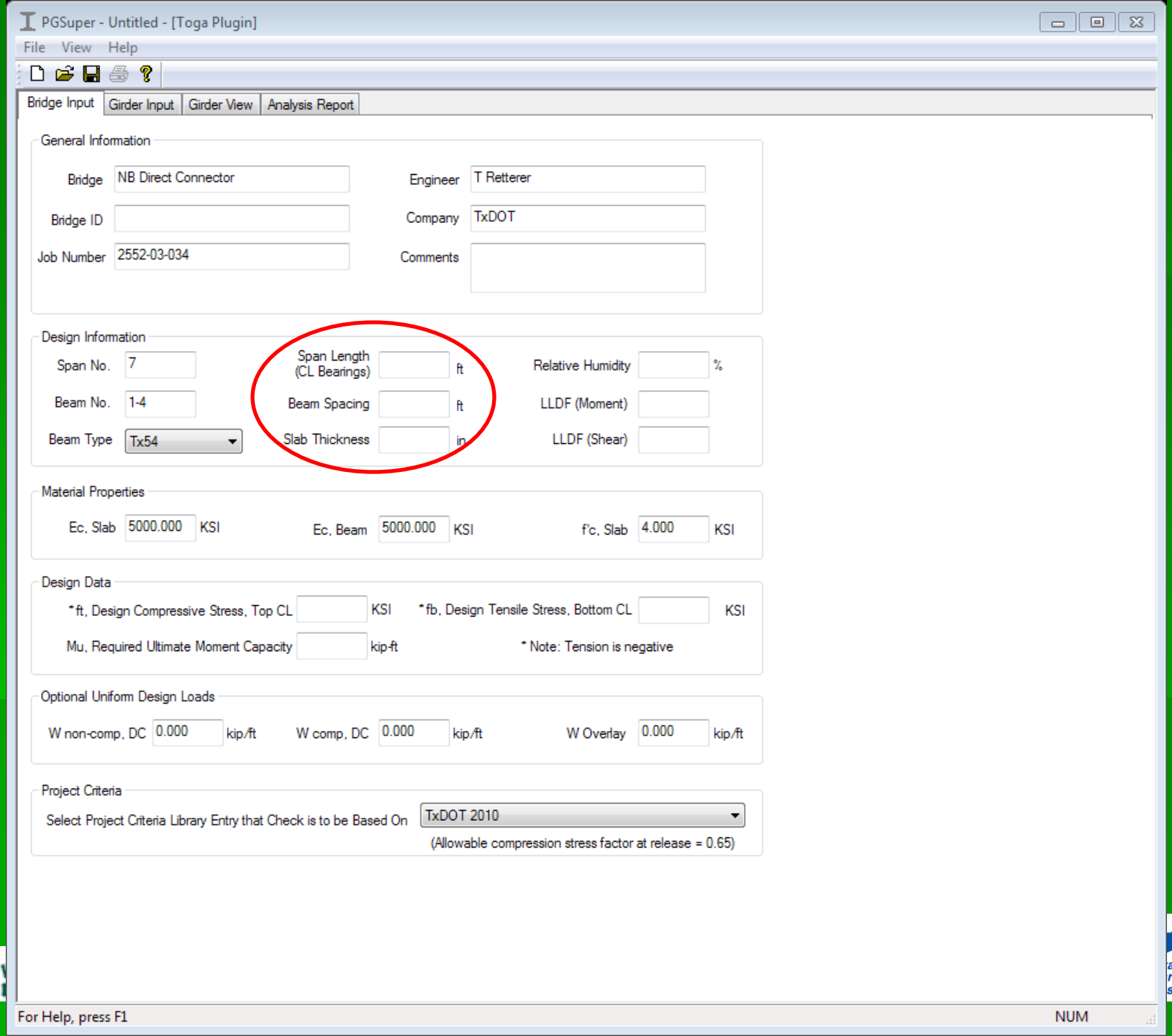
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2552-03-034
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Design Information
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Span Length (CL Bearings)
ft
Relative Humidity
%
Beam No.
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Beam Spacing
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LLDF (Moment)
Beam Type
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Slab Thickness
in
LLDF (Shear)
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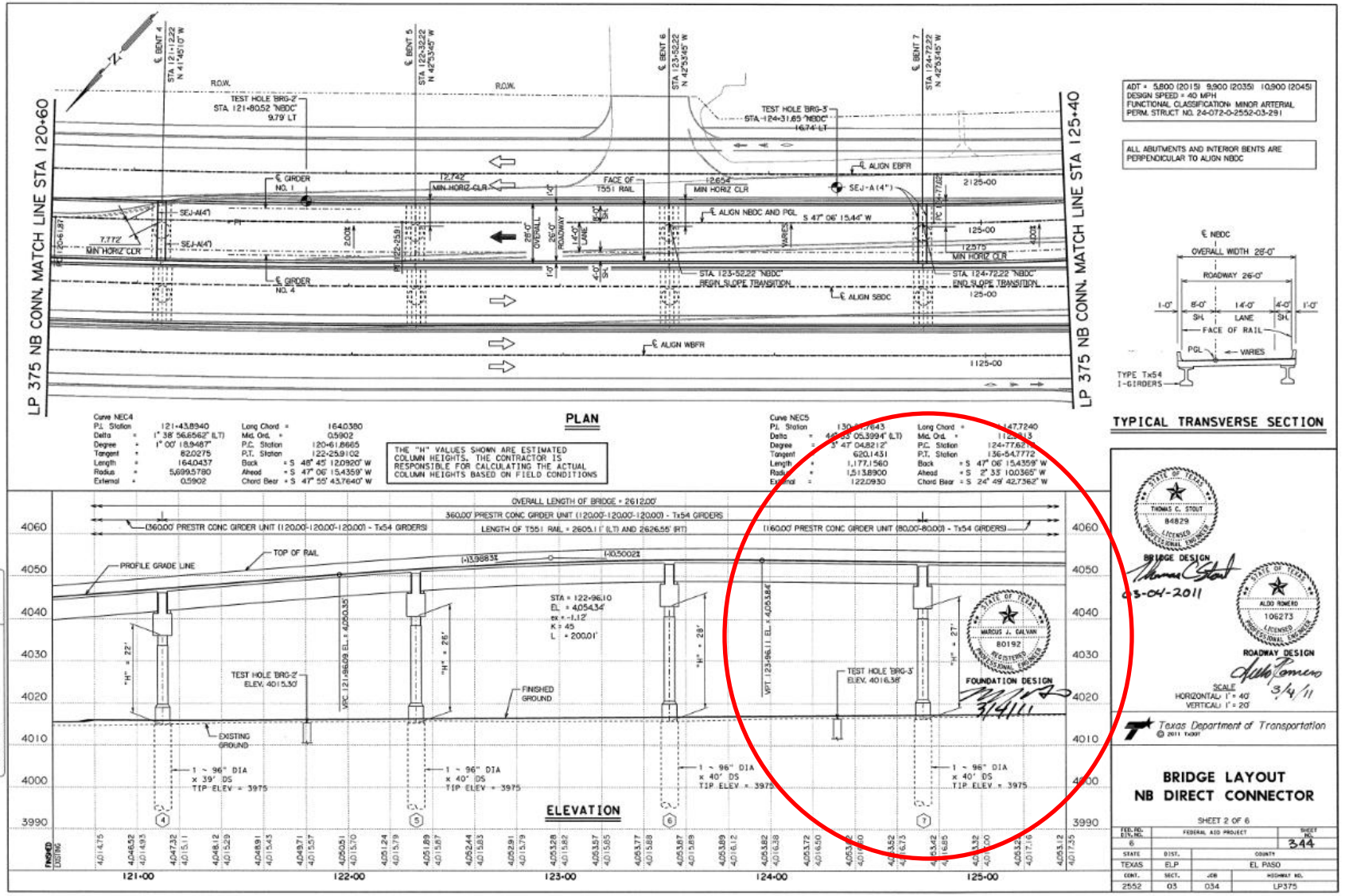

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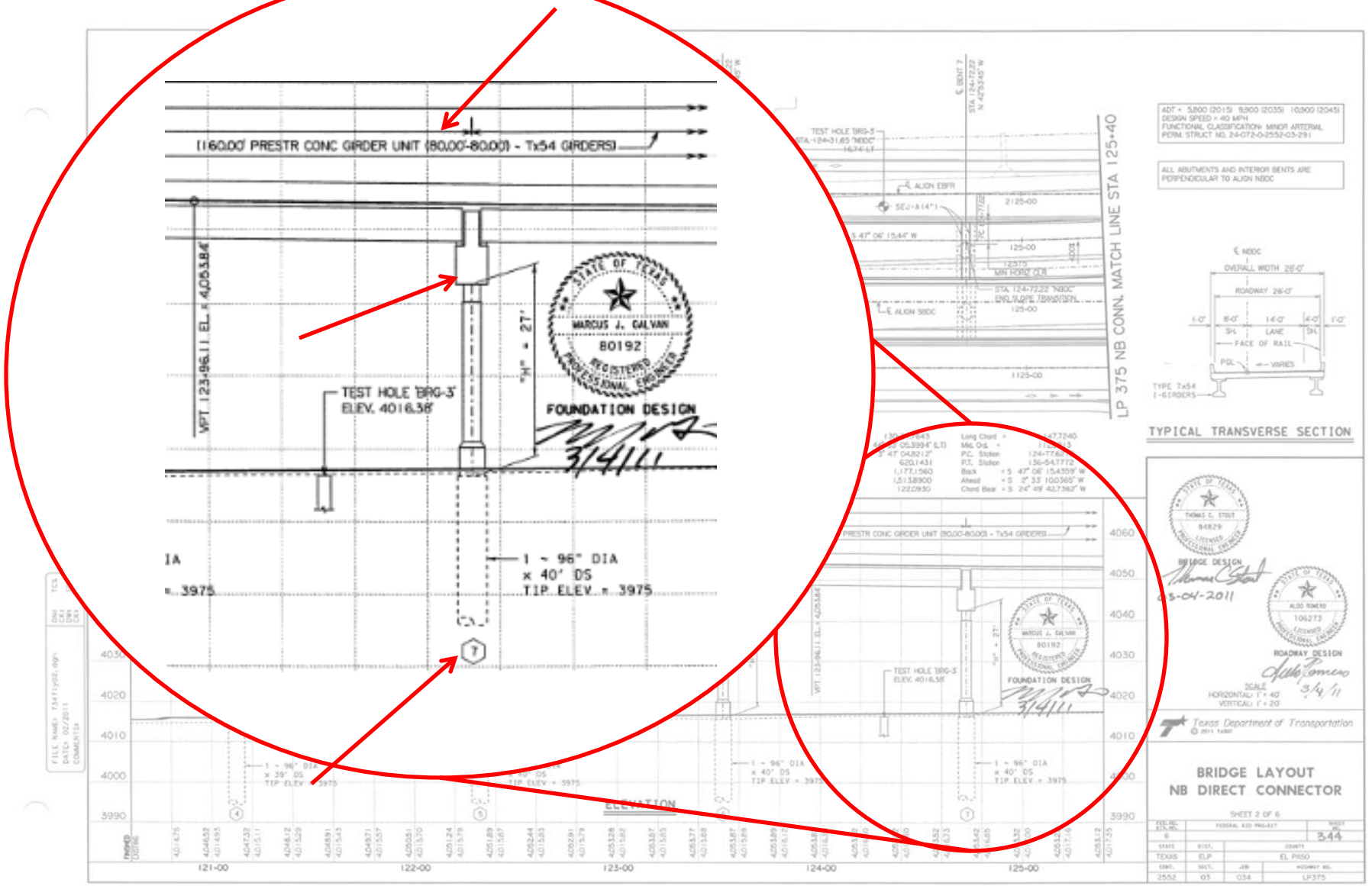
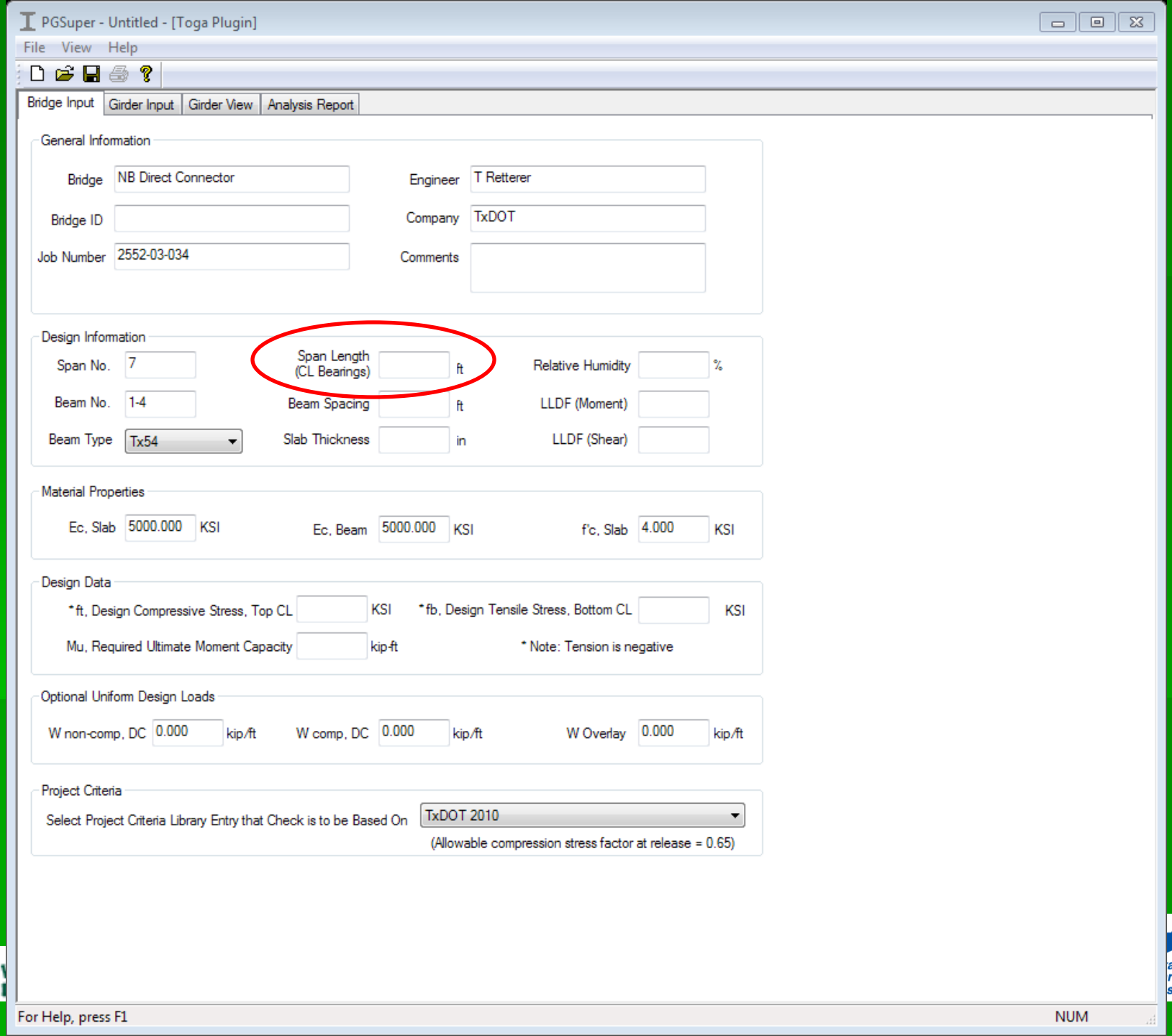
PGSuper
Texas Department of Transportation


(160.00' PRESTR CONC GIRDER UNIT (80.00'-80.00') - Tx54 GIRDERS)
WPT 123+96.11 EL = 4,005.84'
TEST HOLE 'BRG-3'
ELEV. 4016.38'
"H" = 27'
STATE OF TEXAS
MARCUS J. GALVAN
80192
REGISTERED
PROFESSIONAL ENGINEER
FOUNDATION DESIGN
3/4/11
1 - 96" DIA
x 40' DS
TIP ELEV. = 3975
LP 375 NB CONN. MATCH LINE STA 125+40
TYPICAL TRANSVERSE SECTION
BRIDGE DESIGN
05-04-2011
ROADWAY DESIGN
3/4/11
Texas Department of Transportation
BRIDGE LAYOUT
NB DIRECT CONNECTOR
SHEET 2 OF 6
ELEVATION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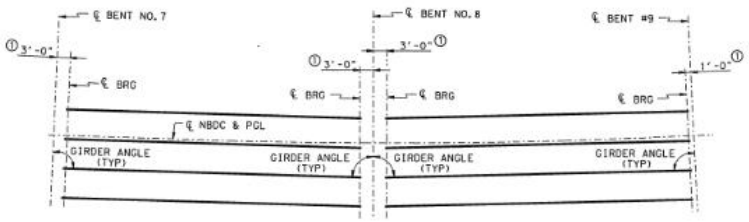
Bridge Input
Girder Input
Girder View
Analysis Report
General Information
Bridge
NB Direct Connector
Engineer
T Retterer
Bridge ID
Company
TxDOT
Job Number
2552-03-034
Comments
Design Information
Span No.
7
Span Length (CL Bearings)
ft
Relative Humidity
%
Beam No.
1-4
Beam Spacing
ft
LLDF (Moment)
Beam Type
Tx54
Slab Thickness
in
LLDF (Shear)
Material Properties
Ec, Slab
5000.000
KSI
Ec, Beam
5000.000
KSI
f'c, Slab
4.000
KSI
Design Data
*ft, Design Compressive Stress, Top CL
KSI
*fb, Design Tensile Stress, Bottom CL
KSI
Mu, Required Ultimate Moment Capacity
kip-ft
* Note: Tension is negative
Optional Uniform Design Loads
W non-comp, DC
0.000
kip/ft
W comp, DC
0.000
kip/ft
W Overlay
0.000
kip/ft
Project Criteria
Select Project Criteria Library Entry that Check is to be Based On
TxDOT 2010
(Allowable compression stress factor at release = 0.65)
For Help, press F1
NUM



SPAN 7
(TX54 GIRDERS)

SPAN 8
(TX54 GIRDERS)

BENT REPORT

BENT NO. 7 (N 42 53 44.56 W)
DISTANCE BETWEEN STATION LINE AND GIRDER 1 6.000 L

		GIRDER SPAC. (C.L. BENT)	GIRDER ANGLE D M S
SPAN 7	GIRDER 1	0.000	88 41 2
	GIRDER 2	7.333	88 41 0
	GIRDER 3	7.333	88 40 59
	GIRDER 4	7.333	88 40 57
	TOTAL	22.000	

BENT NO. 8 (N 45 43 8.51 W)
DISTANCE BETWEEN STATION LINE AND GIRDER 1 6.000 L

		GIRDER SPAC. (C.L. BENT)	GIRDER ANGLE D M S
SPAN 7	GIRDER 1	0.000	88 29 33
	GIRDER 2	7.333	88 29 35
	GIRDER 3	7.333	88 29 36
	GIRDER 4	7.333	88 29 38
	TOTAL	22.000	
SPAN 8	GIRDER 1	0.000	88 29 10
	GIRDER 2	7.333	88 29 10
	GIRDER 3	7.333	88 29 10
	GIRDER 4	7.333	88 29 10
	TOTAL	22.000	

BENT NO. 9 (N 48 44 48.36 W)
DISTANCE BETWEEN STATION LINE AND GIRDER 1 6.000 L

		GIRDER SPAC. (C.L. BENT)	GIRDER ANGLE D M S
SPAN 8	GIRDER 1	0.000	88 29 10
	GIRDER 2	7.333	88 29 10
	GIRDER 3	7.333	88 29 10
	GIRDER 4	7.333	88 29 10
	TOTAL	22.000	

GIRDER REPORT

GIRDER REPORT, SPAN 7

	HORIZONTAL DISTANCE C-C BENT	C-C BRG.	TRUE DISTANCE BOT. GR. FLG. ②	GIRDER SLOPE
GIRDER 1	79.695	73.693	75.19	-0.0050
GIRDER 2	80.057	74.055	75.56	-0.0050
GIRDER 3	80.418	74.416	75.92	-0.0050
GIRDER 4	80.779	74.777	76.28	-0.0050

GIRDER REPORT, SPAN 8

	HORIZONTAL DISTANCE C-C BENT	C-C BRG.	TRUE DISTANCE BOT. GR. FLG. ②	GIRDER SLOPE
GIRDER 1	79.674	75.673	77.17	-0.0050
GIRDER 2	80.061	76.060	77.56	-0.0050
GIRDER 3	80.449	76.448	77.95	-0.0049
GIRDER 4	80.836	76.835	78.34	-0.0049

① SEE IGEB STANDARD FOR ORIENTATION OF DIMENSION.

② GIRDER LENGTHS SHOWN ARE BOTTOM GIRDER FLANGE LENGTHS WITH ADJUSTMENTS MADE FOR GIRDER SLOPE.

STATE OF TEXAS
NICHOLAS NEMEC
102288
LICENSED
PROFESSIONAL ENGINEER

Nicholas Nemec
3/4/2011

Texas Department of Transportation
Bridge Division

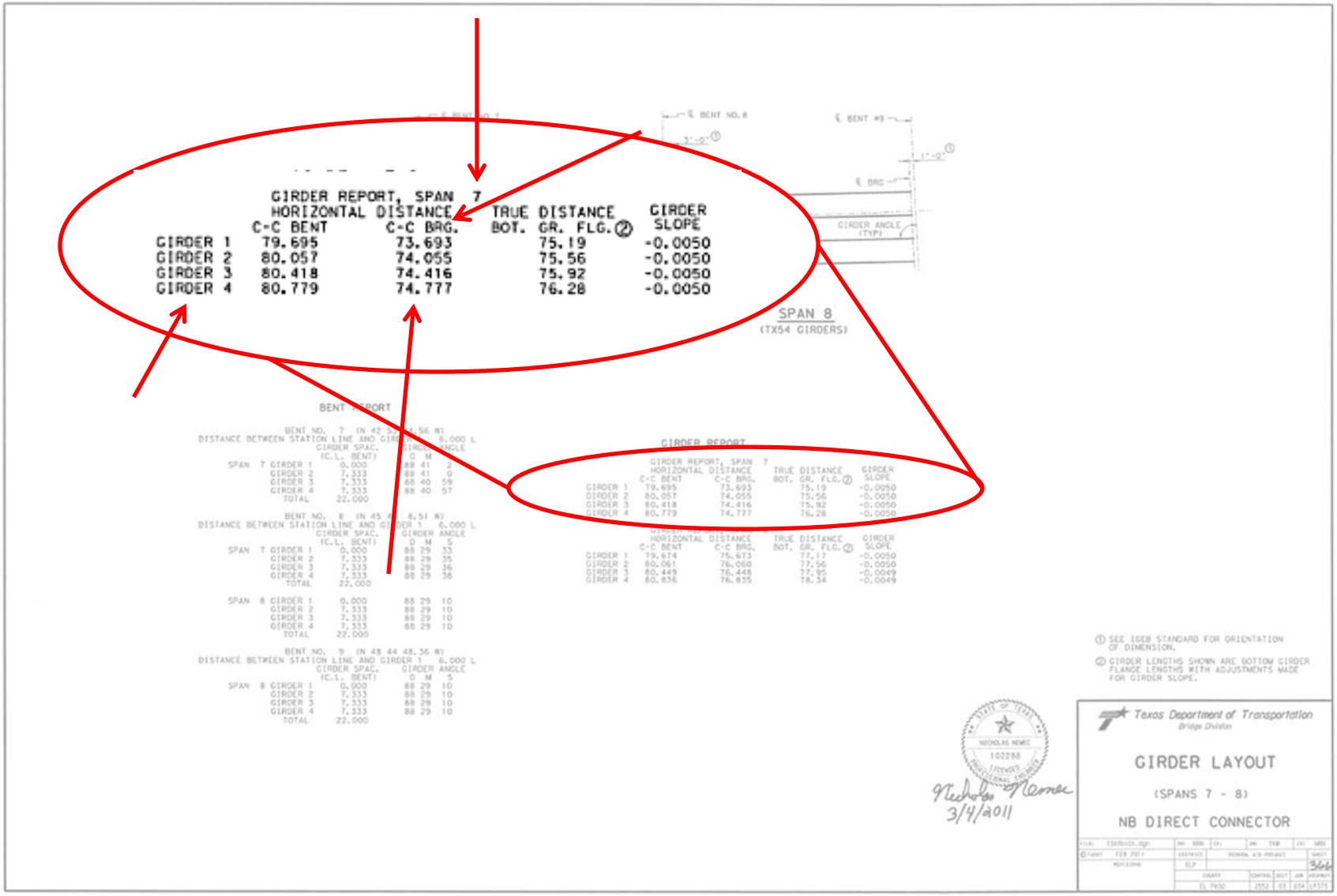
GIRDER LAYOUT

(SPANS 7 - 8)

NB DIRECT CONNECTOR

FILE: 7347b101.dgn	DW: MRN	CK:	DW: TKW	CK: MRN	
© TxDOT FEB 2011	DISTRICT	FEDERAL AID PROJECT			SHEET
REVISIONS	ELP				36b
	COUNTY		CONTROL	SECT	JOB	HIGHWAY
	EL PASO		2552	03	034	LP375

Washington State Department of Transportation
PGSuper
Texas Department of Transportation



GIRDER REPORT, SPAN 7

	HORIZONTAL DISTANCE C-C BENT	C-C BRG.	TRUE DISTANCE BOT. GR. FLG. ②	GIRDER SLOPE
GIRDER 1	79.695	73.693	75.19	-0.0050
GIRDER 2	80.057	74.055	75.56	-0.0050
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GIRDER 4	80.779	74.777	76.28	-0.0050

SPAN 8
(TX54 GIRDERS)

BENT REPORT

BENT NO. 7 (N 42 56 8.56 W)
DISTANCE BETWEEN STATION LINE AND GIRDER 1 6.000 L

		GIRDER SPAC. (C.L. BENT)	GIRDER ANGLE D M S
SPAN 7	GIRDER 1	0.000	88 41 2
	GIRDER 2	7.333	88 41 0
	GIRDER 3	7.333	88 40 59
	GIRDER 4	7.333	88 40 57
	TOTAL	22.000	

BENT NO. 8 (N 45 49 8.51 W)
DISTANCE BETWEEN STATION LINE AND GIRDER 1 6.000 L

		GIRDER SPAC. (C.L. BENT)	GIRDER ANGLE D M S
SPAN 7	GIRDER 1	0.000	88 29 33
	GIRDER 2	7.333	88 29 35
	GIRDER 3	7.333	88 29 36
	GIRDER 4	7.333	88 29 36
	TOTAL	22.000	
SPAN 8	GIRDER 1	0.000	88 29 10
	GIRDER 2	7.333	88 29 10
	GIRDER 3	7.333	88 29 10
	GIRDER 4	7.333	88 29 10
	TOTAL	22.000	

BENT NO. 9 (N 48 44 48.36 W)
DISTANCE BETWEEN STATION LINE AND GIRDER 1 6.000 L

		GIRDER SPAC. (C.L. BENT)	GIRDER ANGLE D M S
SPAN 8	GIRDER 1	0.000	88 29 10
	GIRDER 2	7.333	88 29 10
	GIRDER 3	7.333	88 29 10
	GIRDER 4	7.333	88 29 10
	TOTAL	22.000	

GIRDER REPORT

GIRDER REPORT, SPAN 7

	HORIZONTAL DISTANCE C-C BENT	C-C BRG.	TRUE DISTANCE BOT. GR. FLG. ②	GIRDER SLOPE
GIRDER 1	79.695	73.693	75.19	-0.0050
GIRDER 2	80.057	74.055	75.56	-0.0050
GIRDER 3	80.418	74.416	75.92	-0.0050
GIRDER 4	80.779	74.777	76.28	-0.0050

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GIRDER 1	79.674	75.673	77.17	-0.0050
GIRDER 2	80.061	76.060	77.56	-0.0050
GIRDER 3	80.449	76.448	77.95	-0.0049
GIRDER 4	80.836	76.835	78.34	-0.0049

① SEE IGEB STANDARD FOR ORIENTATION OF DIMENSION.

② GIRDER LENGTHS SHOWN ARE BOTTOM GIRDER FLANGE LENGTHS WITH ADJUSTMENTS MADE FOR GIRDER SLOPE.

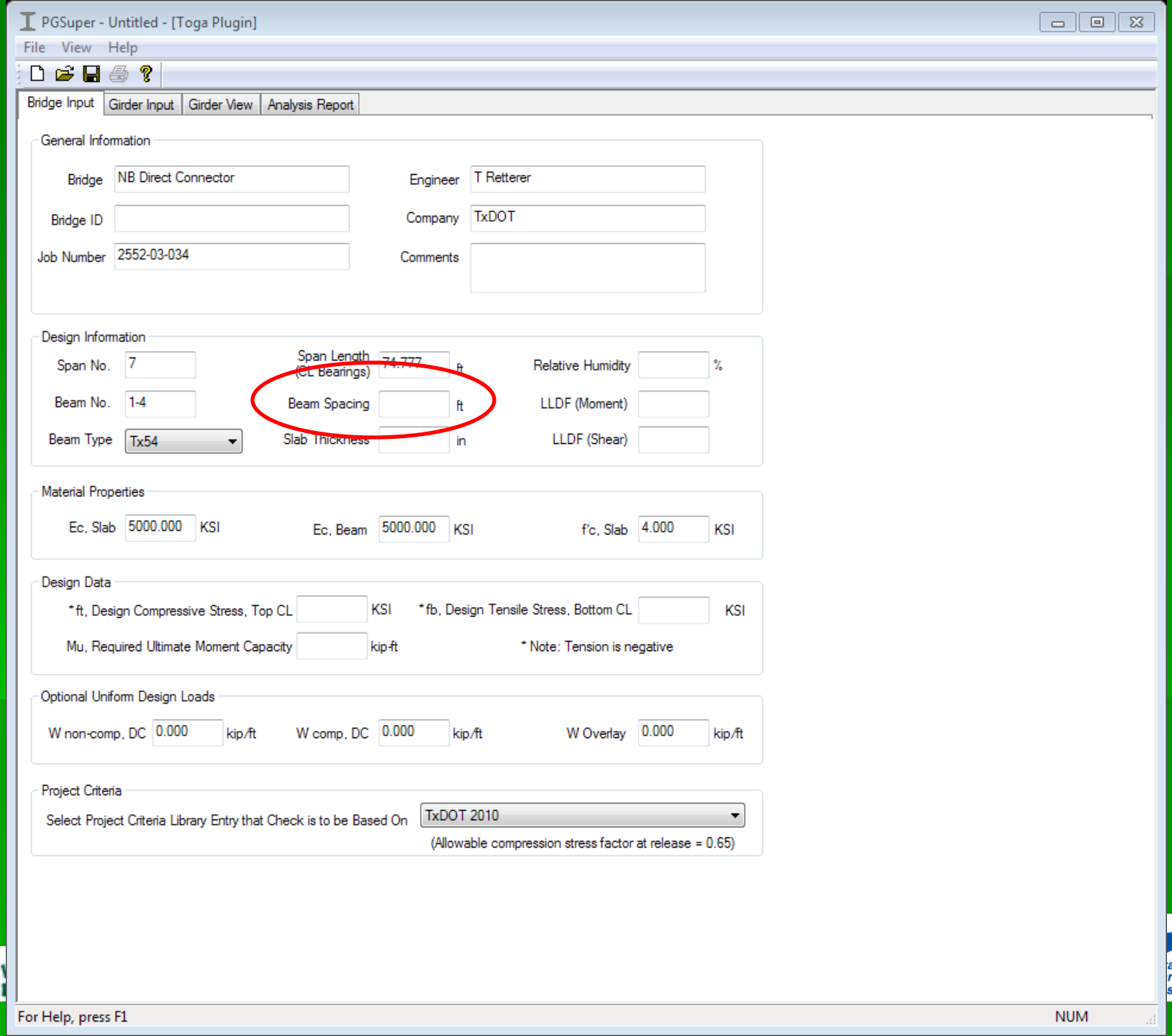
NICHOLAS NEMEC
102288
LICENSED
PROFESSIONAL ENGINEER
3/4/2011

Texas Department of Transportation
Bridge Division

GIRDER LAYOUT

(SPANS 7 - 8)

NB DIRECT CONNECTOR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Girder View
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NB Direct Connector
Engineer
T Retterer
Bridge ID
Company
TxDOT
Job Number
2552-03-034
Comments
Design Information
Span No.
7
Span Length (CL Bearings)
74.777
ft
Relative Humidity
%
Beam No.
1-4
Beam Spacing
ft
LLDF (Moment)
Beam Type
Tx54
Slab Thickness
in
LLDF (Shear)
Material Properties
Ec, Slab
5000.000
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KSI
Design Data
*ft, Design Compressive Stress, Top CL
KSI
*fb, Design Tensile Stress, Bottom CL
KSI
Mu, Required Ultimate Moment Capacity
kip-ft
* Note: Tension is negative
Optional Uniform Design Loads
W non-comp, DC
0.000
kip/ft
W comp, DC
0.000
kip/ft
W Overlay
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kip/ft
Project Criteria
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(Allowable compression stress factor at release = 0.65)
For Help, press F1
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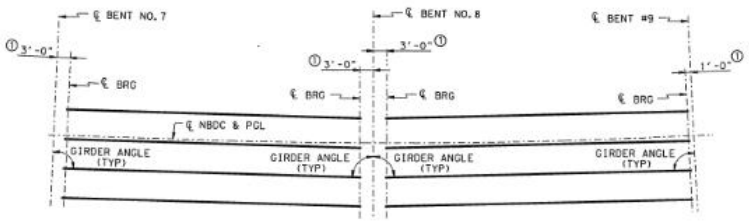

SPAN 7
(TX54 GIRDERS)

SPAN 8
(TX54 GIRDERS)

BENT REPORT

BENT NO. 7 (N 42 53 44.36 W)
DISTANCE BETWEEN STATION LINE AND GIRDER 1 6.000 L

		GIRDER SPAC. (C.L. BENT)	GIRDER ANGLE D M S
SPAN 7	GIRDER 1	0.000	88 41 2
	GIRDER 2	7.333	88 41 0
	GIRDER 3	7.333	88 40 59
	GIRDER 4	7.333	88 40 57
	TOTAL	22.000	

BENT NO. 8 (N 45 43 8.51 W)
DISTANCE BETWEEN STATION LINE AND GIRDER 1 6.000 L

		GIRDER SPAC. (C.L. BENT)	GIRDER ANGLE D M S
SPAN 7	GIRDER 1	0.000	88 29 33
	GIRDER 2	7.333	88 29 35
	GIRDER 3	7.333	88 29 36
	GIRDER 4	7.333	88 29 38
	TOTAL	22.000	
SPAN 8	GIRDER 1	0.000	88 29 10
	GIRDER 2	7.333	88 29 10
	GIRDER 3	7.333	88 29 10
	GIRDER 4	7.333	88 29 10
	TOTAL	22.000	

BENT NO. 9 (N 48 44 48.36 W)
DISTANCE BETWEEN STATION LINE AND GIRDER 1 6.000 L

		GIRDER SPAC. (C.L. BENT)	GIRDER ANGLE D M S
SPAN 8	GIRDER 1	0.000	88 29 10
	GIRDER 2	7.333	88 29 10
	GIRDER 3	7.333	88 29 10
	GIRDER 4	7.333	88 29 10
	TOTAL	22.000	

GIRDER REPORT

GIRDER REPORT, SPAN 7

	HORIZONTAL DISTANCE C-C BENT	C-C BRG.	TRUE DISTANCE BOT. GR. FLG. ②	GIRDER SLOPE
GIRDER 1	79.695	73.693	75.19	-0.0050
GIRDER 2	80.057	74.055	75.56	-0.0050
GIRDER 3	80.418	74.416	75.92	-0.0050
GIRDER 4	80.779	74.777	76.28	-0.0050

GIRDER REPORT, SPAN 8

	HORIZONTAL DISTANCE C-C BENT	C-C BRG.	TRUE DISTANCE BOT. GR. FLG. ②	GIRDER SLOPE
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GIRDER 3	80.449	76.448	77.95	-0.0049
GIRDER 4	80.836	76.835	78.34	-0.0049

① SEE IGEB STANDARD FOR ORIENTATION OF DIMENSION.

② GIRDER LENGTHS SHOWN ARE BOTTOM GIRDER FLANGE LENGTHS WITH ADJUSTMENTS MADE FOR GIRDER SLOPE.

STATE OF TEXAS
NICHOLAS NEMEC
102288
LICENSED PROFESSIONAL ENGINEER

Nicholas Nemec
3/4/2011

Texas Department of Transportation
Bridge Division

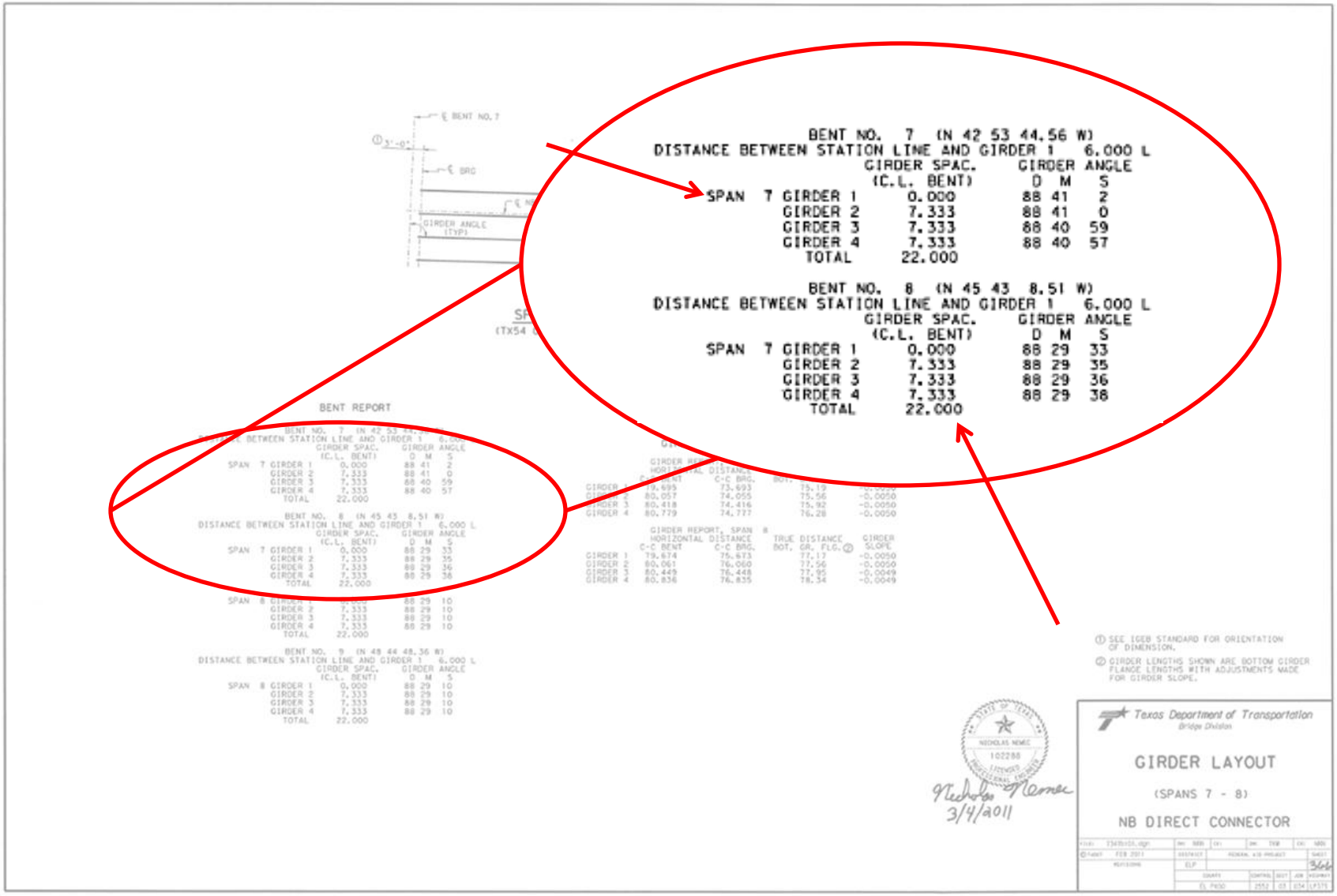
GIRDER LAYOUT

(SPANS 7 - 8)

NB DIRECT CONNECTOR

FILE: 7347b101.dgn	DW: MRN	CK:	DW: TKW	CK: MRN	
© TxDOT FEB 2011	DISTRICT		FEDERAL AID PROJECT		SHEET
REVISIONS	ELP				36b
	COUNTY		CONTROL	SECT	JOB	HIGHWAY
	EL PASO		2552	03	034	LP375

Washington State Department of Transportation
PGSuper
Texas Department of Transportation



BENT NO. 7 (N 42 53 44.56 W)
DISTANCE BETWEEN STATION LINE AND GIRDER 1 6.000 L

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SPAN 7	GIRDER 1	0.000	88 41 2
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	GIRDER 3	7.333	88 40 59
	GIRDER 4	7.333	88 40 57
	TOTAL	22.000	

BENT NO. 8 (N 45 43 8.51 W)
DISTANCE BETWEEN STATION LINE AND GIRDER 1 6.000 L

		GIRDER SPAC. (C.L. BENT)	GIRDER ANGLE D M S
SPAN 7	GIRDER 1	0.000	88 29 33
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	GIRDER 3	7.333	88 29 36
	GIRDER 4	7.333	88 29 38
	TOTAL	22.000	

BENT REPORT

① SEE IGEB STANDARD FOR ORIENTATION OF DIMENSION.

② GIRDER LENGTHS SHOWN ARE BOTTOM GIRDER FLANGE LENGTHS WITH ADJUSTMENTS MADE FOR GIRDER SLOPE.

NICHOLAS NEMEC 102288 LICENSED PROFESSIONAL ENGINEER
3/4/2011

Texas Department of Transportation
Bridge Division

GIRDER LAYOUT

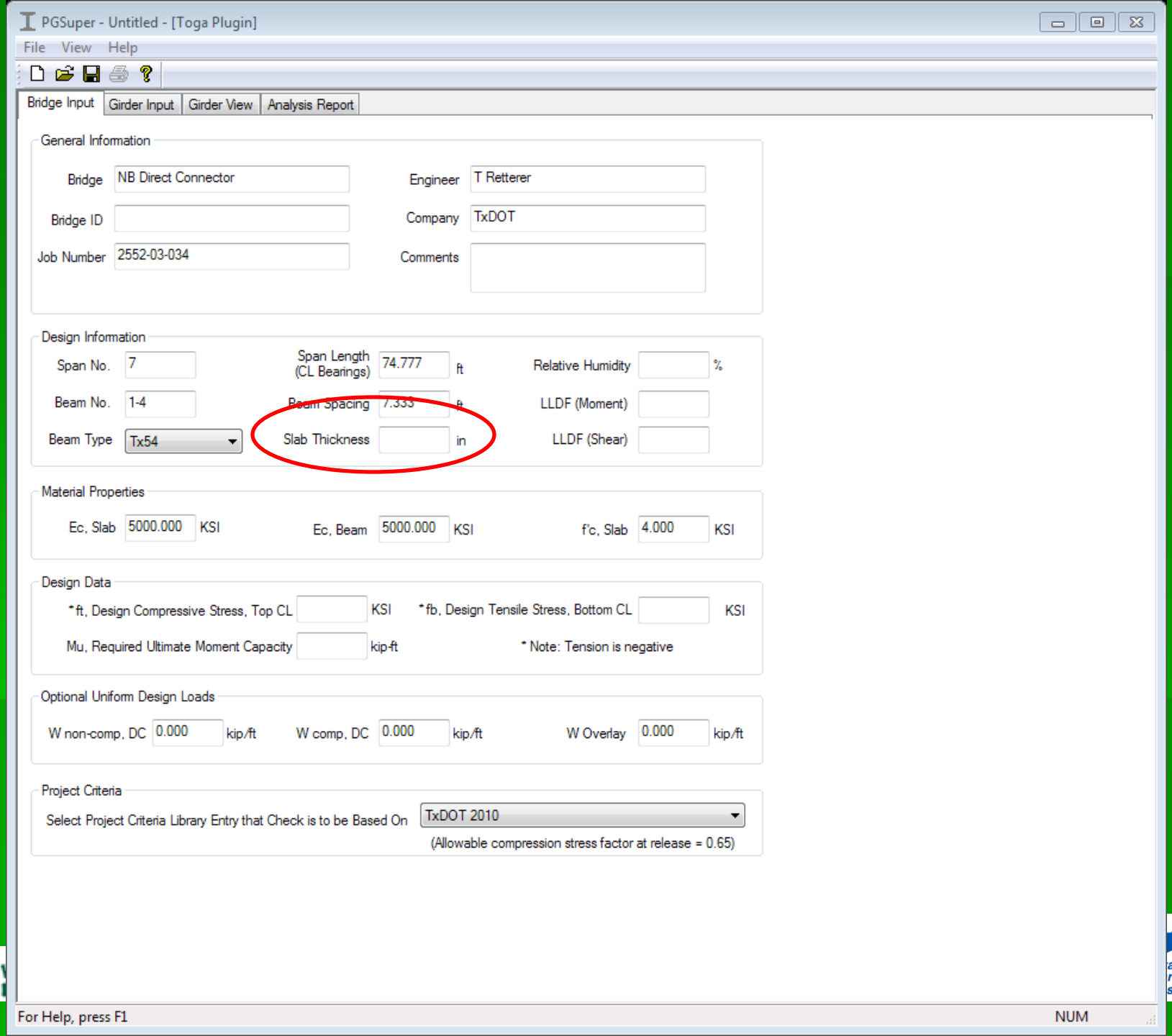
(SPANS 7 - 8)

NB DIRECT CONNECTOR

Washington State Department of Transportation

PGSuper

Texas Department of Transportation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kip/ft
Project Criteria
Select Project Criteria Library Entry that Check is to be Based On
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For Help, press F1
NUM

Span No.	Girder No.	"A" Ft	"B" Ft
7	1 - 4	0.019	0.027
8	1 - 4	0.021	0.030

DEAD LOAD DEFLECTION DIAGRAM

NOTE: Deflection shown are due to concrete slab only. (E_C = 5 x 10⁶psi) Calculated deflections shown are theoretical and actual dimensions may be less. Deflections shall be adjusted based on field observations.

TABLE OF SECTION DEPTHS

Span No.	Girder No.	"X" at ℄ Brg	"Y" at ℄ Brg	"Z" at ℄ Span ③
7	1 - 4	11 ½"	5'-5 ½"	10"
8	1 - 4	11 ½"	5'-5 ½"	10"

③ Theoretical dimension

TABLE OF ESTIMATED QUANTITIES

SPAN	REINFORCED CONCRETE SLAB (HPC) (CL. S)	PRESTR CONC I-GIRDERS (TX54) ⑤	CLASS "S" CONCRETE (HPC)	REINFORCING STEEL
NO.	SF	LF	CY	Lb
7	2247 ⑥	302.95	66.2	14606
8	2247	311.02	65.5	14606
TOTAL	4494	613.97	131.7	29212 ④

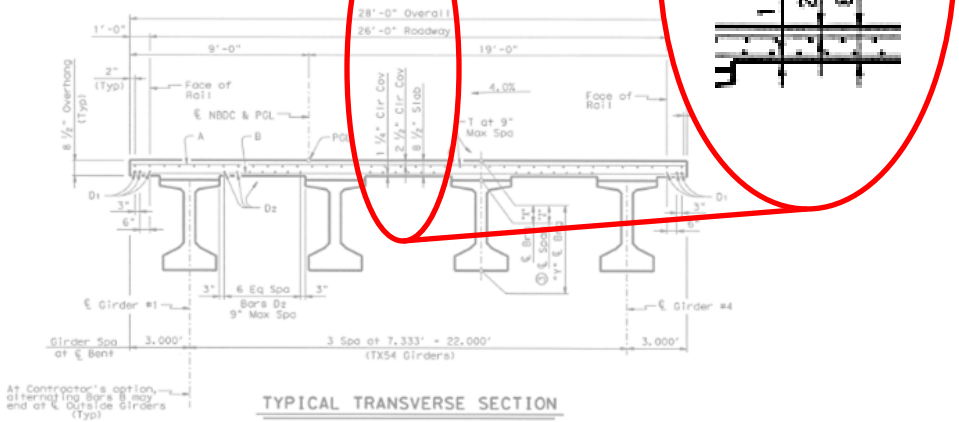
④ Reinforcing steel weight is calculated using an approximate factor of 6.5 Lbs per Sq Ft.

⑤ Lengths shown are bottom girder flange lengths with adjustments made for beam slope. See GIRDER LAYOUT for girder lengths.

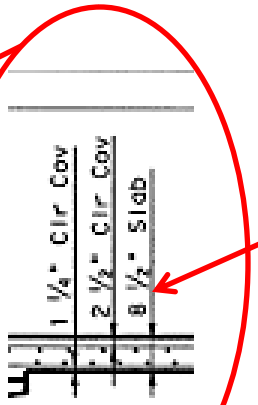
⑥ Includes 56 SF of slab on the top of Bent No. 7.

BAR TABLE

BAR	SIZE
A	#5
B	#5
D	#5
G	#5
H	#5
J	#5
M	#5
T	#4
W	#4
Y	#4
Z	#4



TYPICAL TRANSVERSE SECTION



GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications, 5th Edition (2010).

See PCP or PMDF standards for details and quantity adjustments if either of these options are used.

See IGTS standard for Thickened Slab End details.

See IGMS(MOD) standard for miscellaneous details not shown.

All reinforcing steel shall be Grade 60.

Concrete shall be Class "S" (HPC).

Concrete strength f'c = 4000 psi.

Bar laps, where required, shall be as follows: #4 = 1'-5"
#5 = 1'-9"

See railing details for rail anchorage in slab.

HL93 LOADING

SHEET 2 OF 2

NICHOLAS NEMEC 102288 LICENSED PROFESSIONAL ENGINEER

Nicholas Nemec 3/4/2011

Texas Department of Transportation
Bridge Division

160.00' PRESTRESSED CONCRETE I-GIRDER UNIT

(SPANS 7 & 8)

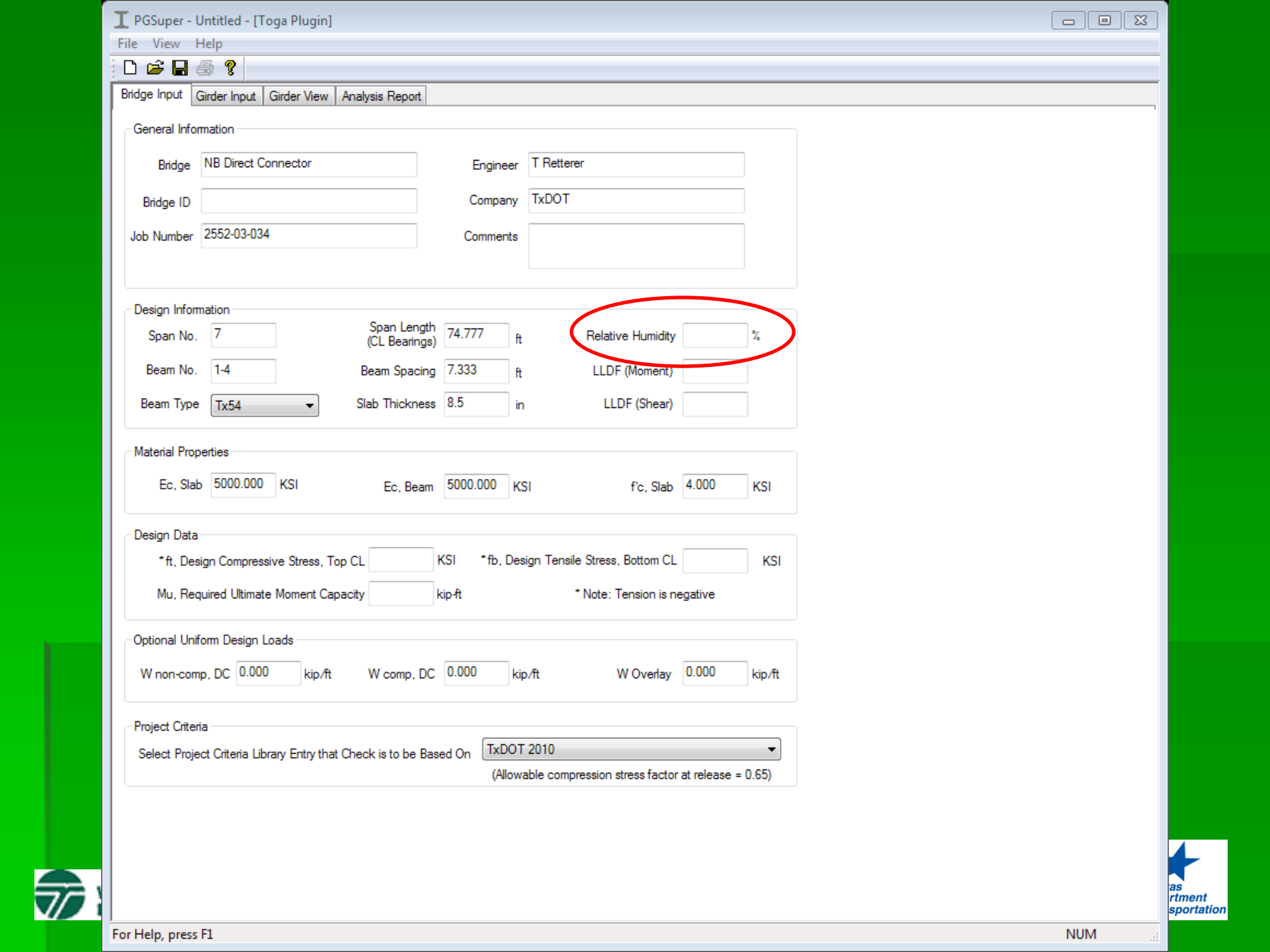
NB DIRECT CONNECTOR

FILE: T34TEXCL.dgn	DW: MEN	CK:	DW: TXB	CK: MEN
©TxDOT FEB 2011	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS	ELP			360 B
	COUNTY	CONTROL	SECT	JOB
	EL PASO	2552	03	034 LP375

Washington State Department of Transportation

PGSuper

Texas Department of Transportation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Beam Spacing
7.333
ft
LLDF (Moment)
Beam Type
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Slab Thickness
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in
LLDF (Shear)
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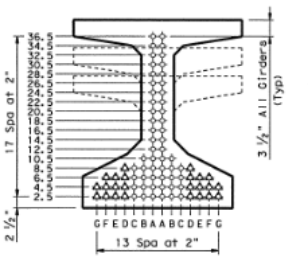
kip/ft
W comp, DC
0.000
kip/ft
W Overlay
0.000
kip/ft
Project Criteria
Select Project Criteria Library Entry that Check is to be Based On
TxDOT 2010
(Allowable compression stress factor at release = 0.65)
For Help, press F1
NUM

DESIGNED GIRDERS (DEPRESSED STRANDS)

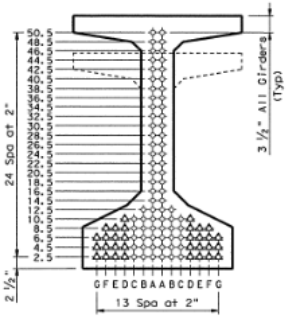
STRUCTURE	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STD STRAND PATTERN	PRESTRESSING STRANDS: TOTAL NO.	SIZE (in)	STRGTH fpu (ksi)	"e" @ (in)	"e" END (in)	DEPRESSED NO.	DEPRESSED TO (in)	CONCRETE: RELEASE STRGTH (1) f'ci (ksi)	CONCRETE: MINIMUM 28 DAY COMP STRGTH f'c (ksi)
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	(4)	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400
	2	ALL	Tx46	(5)	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100
	3-6 & 16-20	ALL	Tx54		60	½	270	17.61	10.94	10	50.5	5.400	6.100
	7-8 & 12-13	ALL	Tx54		22	½	270	20.28	19.19	4	10.5	4.000	5.000
	14	ALL	Tx54		30	½	270	19.81	17.41	6	18.5	4.000	5.000
	15	ALL	Tx54		66	½	270	17.07	10.52	12	48.5	5.800	6.400
	21	ALL	Tx54		62	½	270	17.46	11.01	10	50.5	5.600	6.300
SOUTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	(4)	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400
	2	ALL	Tx46	(5)	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100
	3-8 & 16-18	ALL	Tx54		60	½	270	17.61	10.94	10	50.5	5.400	6.100
	9&14	ALL	Tx54		30	½	270	19.81	17.41	6	18.5	4.000	5.000
	13	ALL	Tx54		34	½	270	19.48	16.65	6	22.5	4.000	5.000
	15	ALL	Tx54		68	½	270	16.83	9.42	14	50.5	5.800	6.400
	19	ALL	Tx54		62	½	270	17.46	11.01	10	50.5	5.600	6.300

OPTIONAL DESIGN

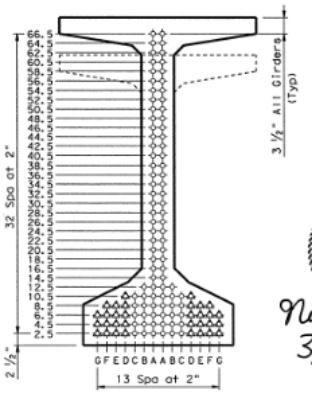
STRUCTURE	SPAN NO.	GIRDER NO.	GIRDER TYPE	DESIGN LOAD COMP STRESS (TOP ℄) (SERVICE I) fct (ksi)	DESIGN LOAD TENSILE STRESS (BOTT ℄) (SERVICE III) fcb (ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (STRENGTH I) (ft-kips)	LIVE LOAD DISTRIBUTION FACTOR (2) Moment	LIVE LOAD DISTRIBUTION FACTOR (2) Shear
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	4.549	-4.394	6639	0.528	0.634
	2	ALL	Tx46	4.399	-4.255	6443	0.528	0.634
	3-6 & 16-20	ALL	Tx54	3.906	-3.944	7752	0.591	0.767
	7-8 & 12-13	ALL	Tx54	1.829	-1.948	4110	0.656	0.767
	14	ALL	Tx54	2.345	-2.479	5200	0.688	0.767
	15	ALL	Tx54	4.008	-4.128	8367	0.688	0.767
	21	ALL	Tx54	4.026	-4.058	7954	0.588	0.767
SOUTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	4.549	-4.394	6639	0.528	0.634
	2	ALL	Tx46	4.399	-4.255	6443	0.528	0.634
	3-8 & 16-18	ALL	Tx54	3.906	-3.945	7754	0.591	0.767
	9&14	ALL	Tx54	2.384	-2.490	5122	0.633	0.767
	13	ALL	Tx54	2.583	-2.682	5474	0.625	0.767
	15	ALL	Tx54	4.068	-4.211	8594	0.718	0.767
	19	ALL	Tx54	4.026	-4.059	7956	0.588	0.767



TYPE Tx28, Tx34 & Tx40 (3)



TYPE Tx46 & Tx54 (3)



TYPE Tx62 & Tx70 (3)

NON-STANDARD STRAND PATTERNS

PATTERN	STRAND ARRANGEMENT AT ℄ OF GIRDER
(4)	A(2.5, 4.5, 6.5, 8.5, 10.5, 12.5)
	B(2.5, 4.5, 6.5, 8.5, 10.5, 12.5)
	C(2.5, 4.5, 6.5, 8.5, 10.5)
	D(2.5, 4.5, 6.5, 8.5, 10.5)
	E(2.5, 4.5)
(5)	A(2.5, 4.5, 6.5, 8.5, 10.5)
	B(2.5, 4.5, 6.5, 8.5, 10.5)
	C(2.5, 4.5, 6.5, 8.5, 10.5)
	D(2.5, 4.5, 6.5, 8.5, 10.5)
	E(2.5, 4.5)

GENERAL NOTES:

Designed in accordance with AASHTO LRFD Specifications.

All concrete must be Class H. Provide Class H(HPC) if shown elsewhere in plans. All reinforcing bars must be Grade 60.

When shown on this sheet, the Fabricator has the option of furnishing either the designed depressed strand girder or an approved optional design. All optional design submittals must be signed, sealed and dated by a registered Professional Engineer.

Optional designs for girders 120 feet or longer must have a calculated residual camber equal to or greater than that of the designed girder.

Prestress losses for the designed girders have been calculated for a relative humidity of 60 percent. Optional designs must likewise conform.

For depressed strand designed girders, strands must be located as low as possible on the 2" grid system unless a Non-Standard Strand Pattern is indicated. Fill row "2.5", then row "4.5". Then proceed upward filling each row in the "A" position and working outward until the required number of strands is reached. All strands in the "A" position must be depressed, maintaining the 2" spacing so that, at the girder ends, the upper two strands are in the position shown in the table.

Strands for the designed girder must be low relaxation strands pretensioned to 75 percent of fpu each.

Seal cracks in girder ends exceeding 0.005" in width as directed by the Engineer. The fabricator is permitted to decrease the spacing of Bars R and S by providing additional bars to help limit crack width provided the decreased spacing results in no less than 1" clear between bars. The fabricator must take an approved corrective action if cracks greater than 0.005" form on a repetitive basis.

(1) Based on the following allowable stresses (ksi):

Compression = 0.65 f'ci

Tension = $0.24\sqrt{f'ci}$

Optional designs must likewise conform.

(2) Portion of full HL93.

(3) Full-length debonded strands are only permitted in strand positions marked Δ. Double wrap full-length debonded strands in outermost position of each row. Full-length debonding must comply with Item 426.4.F.4.

HL93 LOADING

NICHOLAS NEMEC 102288 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

Nicholas Nemec 3/24/2011

Texas Department of Transportation
Bridge Division

PRESTRESSED CONCRETE I-GIRDER DESIGNS (NON-STANDARD SPANS)

IGND

FILE:	lgndstd.dgn	DN: JMH	CK: TxDOT	DW: JTR	CK: TxDOT
©TxDOT	June 2007	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS 02/05h General Notes. 10/05h General Notes. 12/15h Rel Strgth & LLDF.		ELP			446
		COUNTY	CONTROL	SECT	JOB	HIGHWAY
		EL PASO	2592	03	034	LP 375

Revised 03-23-11

DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty is expressed or implied, when the standard is used for other projects than intended. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

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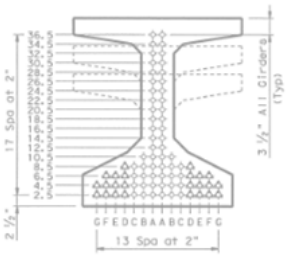
of the designed girder.
Prestress losses for the designed girders have been calculated for a relative humidity of 60 percent. Optional designs must likewise conform.

DESIGNED GIRDERS (DEPRESSED STRANDS)

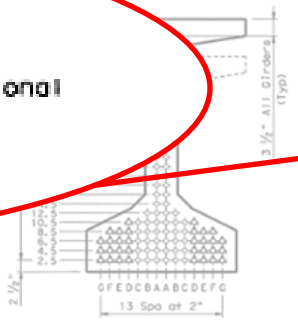
STRUCTURE	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STD STRAND PATTERN	PRESTRESSING STRANDS: TOTAL NO.	SIZE (in)	STR'TH fpu (ksi)	"e" @ ℄ (in)	"e" END (in)	DEPRESSED NO.	DEPRESSED TO (in)	CONCRETE: RELEASE STRGTH ① f'ci (ksi)	CONCRETE: MINIMUM 28 DAY COMP STRGTH f'c (ksi)
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	④	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400
	2	ALL	Tx46	⑤	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100
	3-6 & 16-20	ALL	Tx54		60	½	270	17.61	10.94	10	50.5	5.400	6.100
	7-8 & 12-13	ALL	Tx54		22	½	270	20.28	13.61	10	50.5	5.400	6.100
SOUTHBOUND DIRECT CONNECTOR	9&14												
	13	ALL	Tx54		34	½	270					5.600	6.300
	15	ALL	Tx54		68	½	270	16.83	9.42	14	50.5	5.800	6.400
	19	ALL	Tx54		62	½	270	17.46	11.01	10	50.5	5.600	6.300

OPTIONAL DESIGN

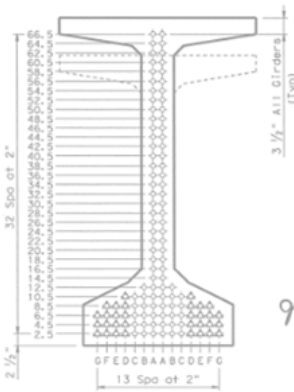
STRUCTURE	SPAN NO.	GIRDER NO.	GIRDER TYPE	DESIGN LOAD COMP. STRESS (TOP ℄) (SERVICE I) fct (ksi)	DESIGN LOAD TENSILE STRESS (BOTT ℄) (SERVICE III) fcb (ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (STRENGTH I) (ft-k)(pa)	LIVE LOAD DISTRIBUTION FACTOR ② Moment	LIVE LOAD DISTRIBUTION FACTOR ② Shear
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	4.549	-4.394	6639	0.528	0.634
	2	ALL	Tx46	4.399	-4.255	6443	0.528	0.634
	3-6 & 16-20	ALL	Tx54	3.906	-3.944	7752	0.591	0.767
	7-8 & 12-13	ALL	Tx54	3.948	-3.948	4110	0.656	0.767
SOUTHBOUND DIRECT CONNECTOR	9&14							
	13	ALL	Tx54			5474	0.625	0.767
	15	ALL	Tx54	4.068	-4.211	8594	0.718	0.767
	19	ALL	Tx54	4.026	-4.059	7956	0.588	0.767



TYPE Tx28, Tx34 & Tx40③



TYPE Tx46 & Tx54③



TYPE Tx62 & Tx70③

NON-STANDARD STRAND PATTERNS

PATTERN	STRAND ARRANGEMENT AT ℄ OF GIRDER
④	A(2.5, 4.5, 6.5, 8.5, 10.5, 12.5)
	B(2.5, 4.5, 6.5, 8.5, 10.5, 12.5)
	C(2.5, 4.5, 6.5, 8.5, 10.5)
	D(2.5, 4.5, 6.5, 8.5, 10.5)
	E(2.5, 4.5)
⑤	A(2.5, 4.5, 6.5, 8.5, 10.5)
	B(2.5, 4.5, 6.5, 8.5, 10.5)
	C(2.5, 4.5, 6.5, 8.5, 10.5)
	D(2.5, 4.5, 6.5, 8.5, 10.5)
	E(2.5, 4.5)

GENERAL NOTES:

Designed in accordance with AASHTO LRFD Specifications.
All concrete must be Class H. Provide Class H(HPC) if shown elsewhere in plans. All reinforcing bars must be Grade 60.
When shown on this sheet, the Fabricator has the option of furnishing either the designed depressed strand girder or an approved optional design. All optional design submittals shall be signed, sealed and dated by a registered Professional [illegible].
Optional designs for [illegible] girder must have a camber equal to or greater than that of the designed girder.
Prestress losses for the designed girders have been calculated for a relative humidity of 60 percent. Optional designs must likewise conform.
For depressed strand designed girders, strands must be located as low as possible on the 2" grid system unless a Non-Standard Strand Pattern is indicated. Fill [illegible] 2.5", then row "4.5", [illegible] working outward until the required number of strands is reached. All strands in the "A" position must be depressed, maintaining the 2" spacing so that, at the girder ends, the upper two strands are in the position shown in the table.
Strands for the designed girder must be low relaxation strands pretensioned to 75 percent of fpu each.
Seal cracks in girder ends exceeding 0.005" in width as directed by the Engineer. The fabricator is permitted to decrease the spacing of Bars R and S by providing additional bars to help limit crack width provided the decreased spacing results in no less than 1" clear between bars. The fabricator must take an approved corrective action if cracks greater than 0.005" form on a repetitive basis.

① Based on the following allowable stresses (ksi):
Compression = 0.65 f'ci
Tension = $0.24\sqrt{f'ci}$
Optional designs must likewise conform.

② Portion of full HL93.

③ Full-length debonded strands are only permitted in strand positions marked Δ. Double wrap full-length debonded strands in outermost position of each row. Full-length debonding must comply with Item 426.4.F.4.

HL93 LOADING

NICHOLAS NEMEC 102288 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

Nicholas Nemec 3/24/2011

Texas Department of Transportation
Bridge Division

PRESTRESSED CONCRETE I-GIRDER DESIGNS (NON-STANDARD SPANS)

IGND

File:	Ignstst1.dgn	Dn: JMH	Ck: TxDOT	Dw: JTR	Ck: TxDOT
©TxDOT	June 2007	DISTRICT		FEDERAL AID PROJECT	SHEET
REVISIONS 02/09: General Notes. 10/09: General Notes. 12/10: Bot Strgth & LLDF.		ELP			446
		COUNTY		CONTROL	SECT	JOB	HIGHWAY
		EL PASO		2552	03	034	LP 375

Revised 03-23-11

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LEVEL DISPLAYED ACC:

Washington State Department of Transportation

PGSuper

Texas Department of Transportation

PGSuper - Untitled - [Toga Plugin]

File View Help

Bridge Input | Girder Input | Girder View | Analysis Report

General Information

Bridge	NB Direct Connector	Engineer	T Retterer
Bridge ID		Company	TxDOT
Job Number	2552-03-034	Comments	

Design Information

Span No.	7	Span Length (CL Bearings)	74.777 ft	Relative Humidity	60 %
Beam No.	1-4	Beam Spacing	7.333 ft	LLDF (Moment)	
Beam Type	Tx54	Slab Thickness	8.5 in	LLDF (Shear)	

Material Properties

Ec, Slab	5000.000 KSI	Ec, Beam	5000.000 KSI	f'c, Slab	4.000 KSI

Design Data

*ft, Design Compressive Stress, Top CL	KSI	*fb, Design Tensile Stress, Bottom CL	KSI
Mu, Required Ultimate Moment Capacity	kip-ft	* Note: Tension is negative	

Optional Uniform Design Loads

W non-comp, DC	0.000 kip/ft	W comp, DC	0.000 kip/ft	W Overlay	0.000 kip/ft

Project Criteria

Select Project Criteria Library Entry that Check is to be Based On: TxDOT 2010

(Allowable compression stress factor at release = 0.65)

For Help, press F1 NUM

DESIGNED GIRDERS (DEPRESSED STRANDS)

STRUCTURE	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STD STRAND PATTERN	PRESTRESSING STRANDS: TOTAL NO.	SIZE (in)	STRGTH fpu (ksi)	"e" @ (in)	"e" END (in)	DEPRESSED: NO.	DEPRESSED: TO (in)	CONCRETE: RELEASE STRGTH (1) f'ci (ksi)	CONCRETE: MINIMUM 28 DAY COMP STRGTH f'c (ksi)
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	(4)	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400
	2	ALL	Tx46	(5)	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100
	3-6 & 16-20	ALL	Tx54		60	½	270	17.61	10.94	10	50.5	5.400	6.100
	7-8 & 12-13	ALL	Tx54		22	½	270	20.28	19.19	4	10.5	4.000	5.000
	14	ALL	Tx54		30	½	270	19.81	17.41	6	18.5	4.000	5.000
	15	ALL	Tx54		66	½	270	17.07	10.52	12	48.5	5.800	6.400
	21	ALL	Tx54		62	½	270	17.46	11.01	10	50.5	5.600	6.300

OPTIONAL DESIGN

STRUCTURE	SPAN NO.	GIRDER NO.	DESIGN LOAD COMP STRESS (TOP @) (SERVICE I) fct (ksi)	DESIGN LOAD TENSILE STRESS (BOTT @) (SERVICE III) fcb (ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (STRENGTH I) (ft-kips)	LIVE LOAD DISTRIBUTION FACTOR (2): Moment	LIVE LOAD DISTRIBUTION FACTOR (2): Shear
NORTHBOUND DIRECT CONNECTOR	1	ALL	4.549	-4.394	6639	0.528	0.634
	2	ALL	4.399	-4.255	6443	0.528	0.634
	3-6 & 16-20	ALL	3.906	-3.944	7752	0.591	0.767
	7-8 & 12-13	ALL	1.829	-1.948	4110	0.656	0.767
	14	ALL	2.345	-2.479	5200	0.688	0.767
	15	ALL	4.008	-4.128	8367	0.688	0.767
	21	ALL	4.026	-4.058	7954	0.588	0.767

TYPE Tx62 & Tx70 (3)

Texas Department of Transportation
Bridge Division

PRESTRESSED CONCRETE I-GIRDER DESIGNS (NON-STANDARD SPANS)

IGND

Revised 03-23-11

Nicholas Nemec 3/24/2011

Washington State Department of Transportation

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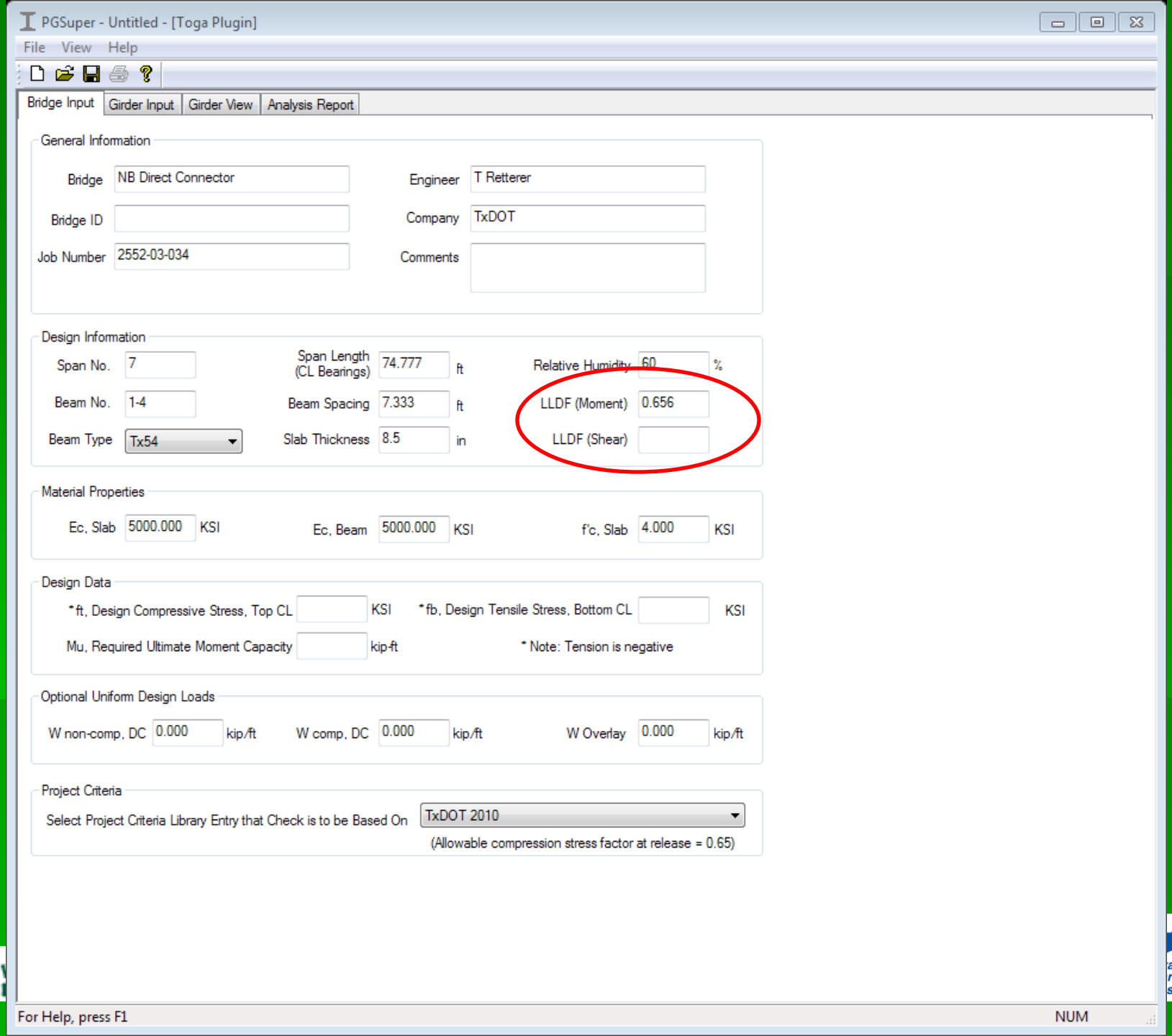
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File View Help
Bridge Input
Girder Input
Girder View
Analysis Report
General Information
Bridge
NB Direct Connector
Engineer
T Retterer
Bridge ID
Company
TxDOT
Job Number
2552-03-034
Comments
Design Information
Span No.
7
Span Length (CL Bearings)
74.777
ft
Relative Humidity
60
%
Beam No.
1-4
Beam Spacing
7.333
ft
LLDF (Moment)
0.656
Beam Type
Tx54
Slab Thickness
8.5
in
LLDF (Shear)
Material Properties
Ec, Slab
5000.000
KSI
Ec, Beam
5000.000
KSI
f'c, Slab
4.000
KSI
Design Data
*ft, Design Compressive Stress, Top CL
KSI
*fb, Design Tensile Stress, Bottom CL
KSI
Mu, Required Ultimate Moment Capacity
kip-ft
* Note: Tension is negative
Optional Uniform Design Loads
W non-comp, DC
0.000
kip/ft
W comp, DC
0.000
kip/ft
W Overlay
0.000
kip/ft
Project Criteria
Select Project Criteria Library Entry that Check is to be Based On
TxDOT 2010
(Allowable compression stress factor at release = 0.65)
For Help, press F1
NUM

DESIGNED GIRDERS (DEPRESSED STRANDS)

STRUCTURE	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STD STRAND PATTERN	PRESTRESSING STRANDS: TOTAL NO.	SIZE (in)	STRGTH fpu (ksi)	"e" @ (in)	"e" END (in)	DEPRESSED: NO.	DEPRESSED: TO (in)	CONCRETE: RELEASE STRGTH (1) f'ci (ksi)	CONCRETE: MINIMUM 28 DAY COMP STRGTH f'c (ksi)
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	(4)	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400
	2	ALL	Tx46	(5)	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100
	3-6 & 16-20	ALL	Tx54		60	½	270	17.61	10.94	10	50.5	5.400	6.100
	7-8 & 12-13	ALL	Tx54		22	½	270	20.28	19.19	4	10.5	4.000	5.000
	14	ALL	Tx54		30	½	270	19.81	17.41	6	18.5	4.000	5.000
	15	ALL	Tx54		66	½	270	17.07	10.52	12	48.5	5.800	6.400
	21	ALL	Tx54		62	½	270	17.46	11.01	10	50.5	5.600	6.300

OPTIONAL DESIGN

STRUCTURE	SPAN NO.	GIRDER NO.	GIRDER TYPE	DESIGN LOAD COMP STRESS (TOP @) (SERVICE I) fct (ksi)	DESIGN LOAD TENSILE STRESS (BOTT @) (SERVICE III) fcb (ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (STRENGTH I) (ft-kips)	LIVE LOAD DISTRIBUTION FACTOR (2): Moment	LIVE LOAD DISTRIBUTION FACTOR (2): Shear
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	4.549	-4.394	6639	0.528	0.634
	2	ALL	Tx46	4.399	-4.255	6443	0.528	0.634
	3-6 & 16-20	ALL	Tx54	3.906	-3.944	7752	0.591	0.767
	7-8 & 12-13	ALL	Tx54	1.829	-1.948	4110	0.656	0.767
	14	ALL	Tx54	2.345	-2.479	5200	0.688	0.767
	15	ALL	Tx54	4.008	-4.128	8367	0.688	0.767
	21	ALL	Tx54	4.026	-4.058	7954	0.588	0.767

TYPE Tx62 & Tx70(3)

Texas Department of Transportation
Bridge Division

PRESTRESSED CONCRETE I-GIRDER DESIGNS (NON-STANDARD SPANS)

IGND

Nicholas Nemec 3/24/2011

Revised 03-23-11

Washington State Department of Transportation

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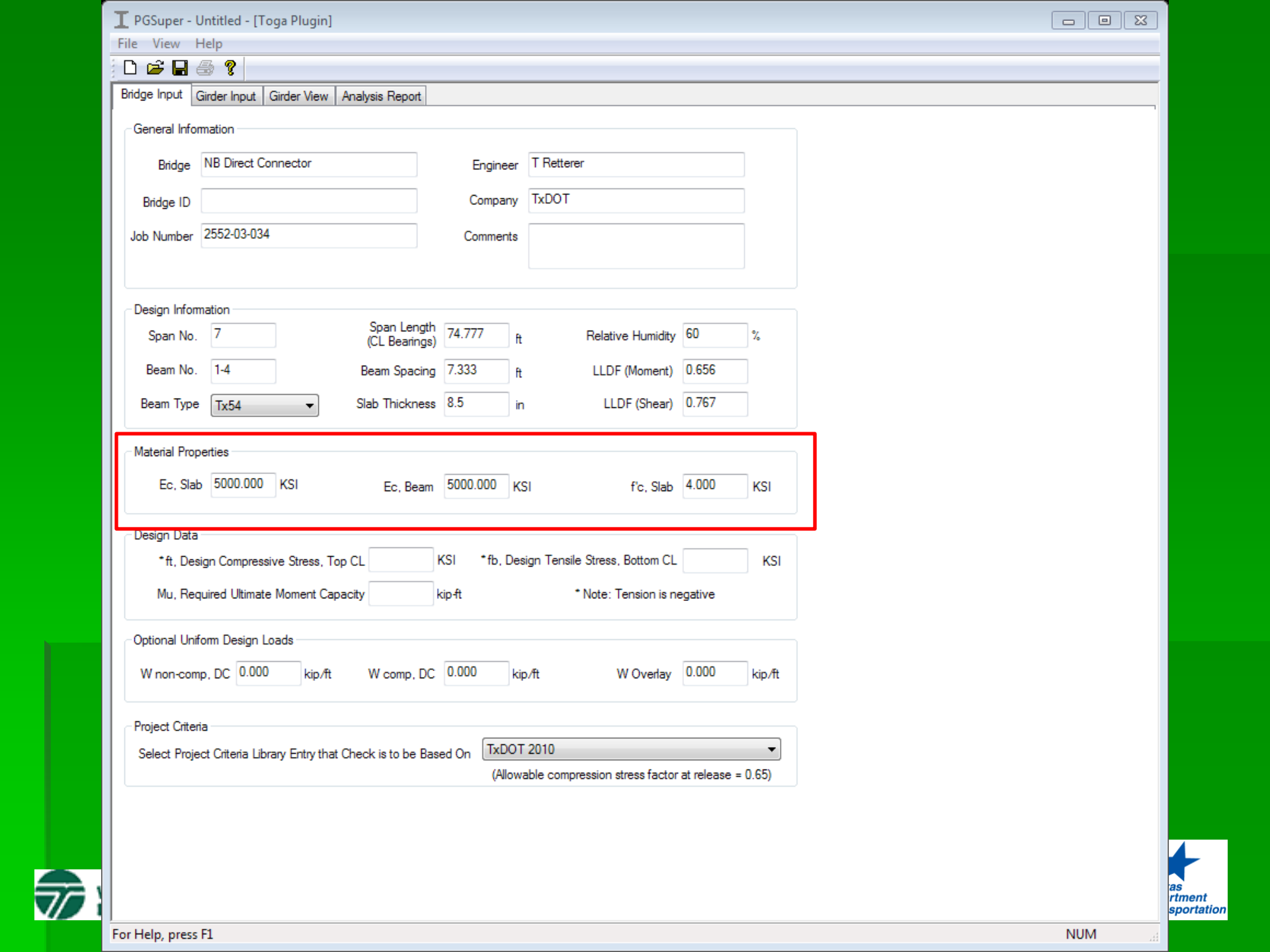
Texas Department of Transportation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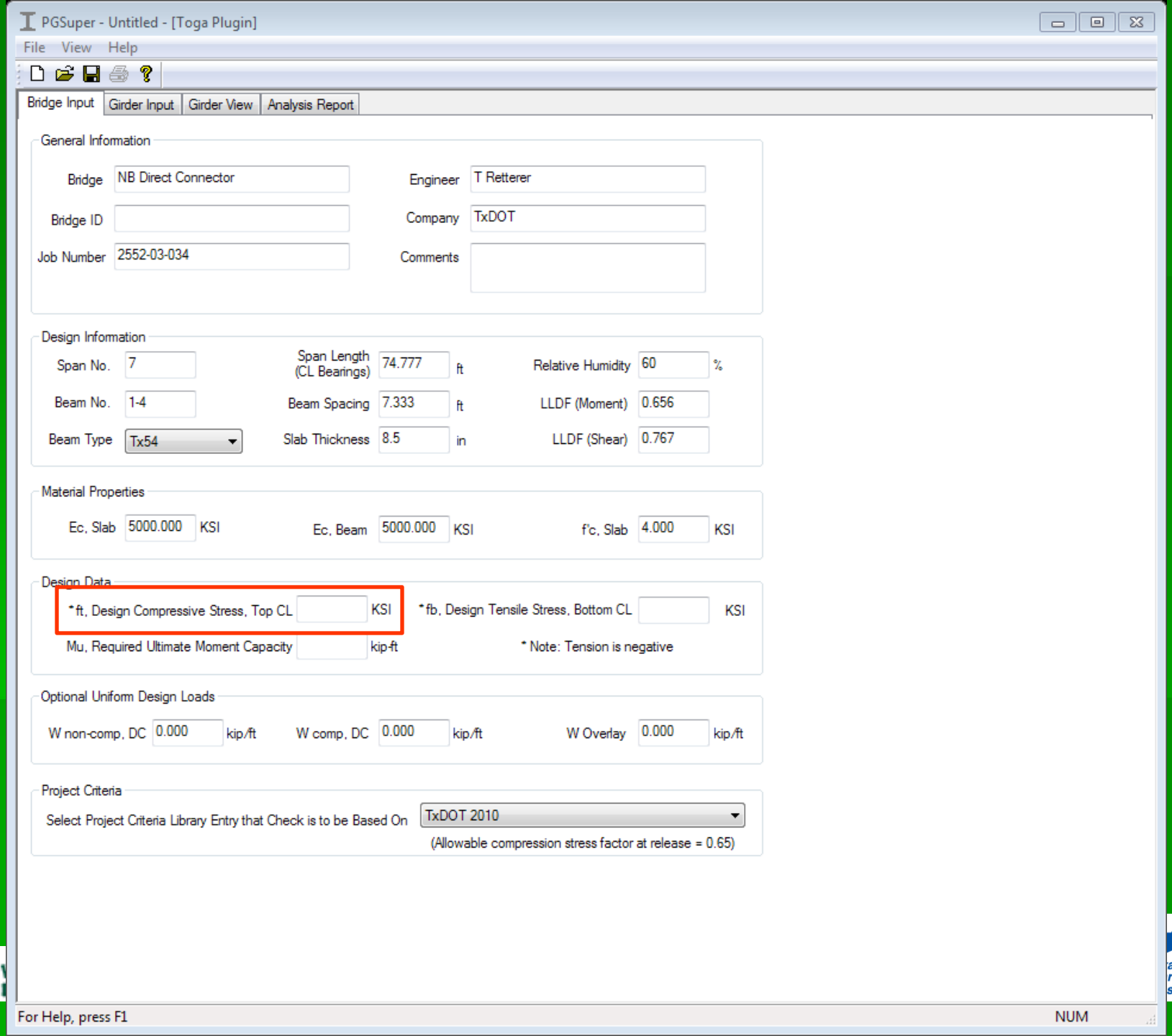
Girder Input
Girder View
Analysis Report
General Information
Bridge
NB Direct Connector
Engineer
T Retterer
Bridge ID
Company
TxDOT
Job Number
2552-03-034
Comments
Design Information
Span No.
7
Span Length (CL Bearings)
74.777
ft
Relative Humidity
60
%
Beam No.
1-4
Beam Spacing
7.333
ft
LLDF (Moment)
0.656
Beam Type
Tx54
Slab Thickness
8.5
in
LLDF (Shear)
0.767
Material Properties
Ec, Slab
5000.000
KSI
Ec, Beam
5000.000
KSI
f'c, Slab
4.000
KSI
Design Data
*ft, Design Compressive Stress, Top CL
KSI
*fb, Design Tensile Stress, Bottom CL
KSI
Mu, Required Ultimate Moment Capacity
kip-ft
* Note: Tension is negative
Optional Uniform Design Loads
W non-comp, DC
0.000
kip/ft
W comp, DC
0.000
kip/ft
W Overlay
0.000
kip/ft
Project Criteria
Select Project Criteria Library Entry that Check is to be Based On
TxDOT 2010
(Allowable compression stress factor at release = 0.65)
For Help, press F1
NUM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File View Help
Bridge Input
Girder Input
Girder View
Analysis Report
General Information
Bridge
NB Direct Connector
Engineer
T Retterer
Bridge ID
Company
TxDOT
Job Number
2552-03-034
Comments
Design Information
Span No.
7
Span Length (CL Bearings)
74.777
ft
Relative Humidity
60
%
Beam No.
1-4
Beam Spacing
7.333
ft
LLDF (Moment)
0.656
Beam Type
Tx54
Slab Thickness
8.5
in
LLDF (Shear)
0.767
Material Properties
Ec, Slab
5000.000
KSI
Ec, Beam
5000.000
KSI
f'c, Slab
4.000
KSI
Design Data
*ft, Design Compressive Stress, Top CL
KSI
*fb, Design Tensile Stress, Bottom CL
KSI
Mu, Required Ultimate Moment Capacity
kip-ft
* Note: Tension is negative
Optional Uniform Design Loads
W non-comp, DC
0.000
kip/ft
W comp, DC
0.000
kip/ft
W Overlay
0.000
kip/ft
Project Criteria
Select Project Criteria Library Entry that Check is to be Based On
TxDOT 2010
(Allowable compression stress factor at release = 0.65)
For Help, press F1
NUM

DESIGNED GIRDERS (DEPRESSED STRANDS)

STRUCTURE	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STD STRAND PATTERN	PRESTRESSING STRANDS TOTAL NO.	PRESTRESSING STRANDS SIZE (in)	PRESTRESSING STRANDS STRGTH fpu (ksi)	PRESTRESSING STRANDS "e" ℄ (in)	PRESTRESSING STRANDS "e" END (in)	PRESTRESSING STRANDS DEPRESSED NO.	PRESTRESSING STRANDS DEPRESSED TO (in)	CONCRETE RELEASE STRGTH ① f'ci (ksi)	CONCRETE MINIMUM 28 DAY COMP STRGTH f'c (ksi)	OPTIONAL DESIGN DESIGN LOAD COMP STRESS (TOP ℄) (SERVICE I) fct (ksi)	OPTIONAL DESIGN DESIGN LOAD TENSILE STRESS (BOTT ℄) (SERVICE III) fcb (ksi)	OPTIONAL DESIGN REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (STRENGTH I) (ft-kips)	OPTIONAL DESIGN LIVE LOAD DISTRIBUTION FACTOR ② Moment	OPTIONAL DESIGN LIVE LOAD DISTRIBUTION FACTOR ② Shear
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	④	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400	4.549	-4.394	6639	0.528	0.634
	2	ALL	Tx46	⑤	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100	4.399	-4.255	6443	0.528	0.634
	3-6 & 16-20	ALL	Tx54		60	½	270	17.61	10.94	10	50.5	5.400	6.100	3.906	-3.944	7752	0.591	0.767
	7-8 & 12-13	ALL	Tx54		22	½	270	20.28	19.19	4	10.5	4.000	5.000	1.829	-1.948	4110	0.656	0.767
	14	ALL	Tx54		30	½	270	19.81	17.41	6	18.5	4.000	5.000	2.345	-2.479	5200	0.688	0.767
	15	ALL	Tx54		66	½	270	17.07	10.52	12	48.5	5.800	6.400	4.008	-4.128	8367	0.688	0.767
	21	ALL	Tx54		62	½	270	17.46	11.01	10	50.5	5.600	6.300	4.026	-4.058	7954	0.588	0.767

NON-STANDARD STRAND PATTERNS

PATTERN	STRAND ARRANGEMENT AT ℄ OF GIRDER
④	A(2.5, 4.5, 6.5, 8.5, 10.5, 12.5)
	B(2.5, 4.5, 6.5, 8.5, 10.5, 12.5)
	C(2.5, 4.5, 6.5, 8.5, 10.5)
	D(2.5, 4.5, 6.5, 8.5, 10.5)
	E(2.5, 4.5)
⑤	A(2.5, 4.5, 6.5, 8.5, 10.5)

TYPE Tx62 & Tx70③

Texas Department of Transportation
Bridge Division

PRESTRESSED CONCRETE I-GIRDER DESIGNS (NON-STANDARD SPANS)

IGND

Nicholas Nemec 3/24/2011

Revised 03-23-11

Washington State Department of Transportation

PGSuper

Texas Department of Transportation

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File View Help

Bridge Input | Girder Input | Girder View | Analysis Report

General Information

Bridge	NB Direct Connector	Engineer	T Retterer
Bridge ID		Company	TxDOT
Job Number	2552-03-034	Comments	

Design Information

Span No.	7	Span Length (CL Bearings)	74.777 ft	Relative Humidity	60 %
Beam No.	1-4	Beam Spacing	7.333 ft	LLDF (Moment)	0.656
Beam Type	Tx54	Slab Thickness	8.5 in	LLDF (Shear)	0.767

Material Properties

Ec, Slab	5000.000 KSI	Ec, Beam	5000.000 KSI	f'c, Slab	4.000 KSI

Design Data

*ft, Design Compressive Stress, Top CL	1.829 KSI	*fb, Design Tensile Stress, Bottom CL	KSI
Mu, Required Ultimate Moment Capacity	kip-ft	* Note: Tension is negative	

Optional Uniform Design Loads

W non-comp, DC	0.000 kip/ft	W comp, DC	0.000 kip/ft	W Overlay	0.000 kip/ft

Project Criteria

Select Project Criteria Library Entry that Check is to be Based On: TxDOT 2010

(Allowable compression stress factor at release = 0.65)

For Help, press F1 NUM

DESIGNED GIRDERS (DEPRESSED STRANDS)

STRUCTURE	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STD STRAND PATTERN	PRESTRESSING STRANDS: TOTAL NO.	SIZE (in)	STRGTH fpu (ksi)	"e" @ (in)	"e" END (in)	DEPRESSED NO.	DEPRESSED TO (in)	CONCRETE: RELEASE STRGTH (1) f'ci (ksi)	MINIMUM 28 DAY COMP STRGTH f'c (ksi)
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	(4)	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400
	2	ALL	Tx46	(5)	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100
	3-6 & 16-20	ALL	Tx54		60	½	270	17.61	10.94	10	50.5	5.400	6.100
	7-8 & 12-13	ALL	Tx54		22	½	270	20.28	19.19	4	10.5	4.000	5.000
	14	ALL	Tx54		30	½	270	19.81	17.41	6	18.5	4.000	5.000
	15	ALL	Tx54		66	½	270	17.07	10.52	12	48.5	5.800	6.400
	21	ALL	Tx54		62	½	270	17.46	11.01	10	50.5	5.600	6.300

OPTIONAL DESIGN

STRUCTURE	SPAN NO.	GIRDER NO.	GIRDER TYPE	DESIGN LOAD COMP STRESS (TOP @) (SERVICE I) fcd (ksi)	DESIGN LOAD TENSILE STRESS (BOTT @) (SERVICE III) fcb (ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (STRENGTH I) (ft-kips)	LIVE LOAD DISTRIBUTION FACTOR (2): Moment	LIVE LOAD DISTRIBUTION FACTOR (2): Shear
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	4.549	-4.394	6639	0.528	0.634
	2	ALL	Tx46	4.399	-4.255	6443	0.528	0.634
	3-6 & 16-20	ALL	Tx54	3.906	-3.944	7752	0.591	0.767
	7-8 & 12-13	ALL	Tx54	1.829	-1.948	4110	0.656	0.767
	14	ALL	Tx54	2.345	-2.479	5200	0.688	0.767
	15	ALL	Tx54	4.008	-4.128	8367	0.688	0.767
	21	ALL	Tx54	4.026	-4.058	7954	0.588	0.767

NON-STANDARD STRAND PATTERNS

PATTERN	STRAND ARRANGEMENT AT ℄ OF GIRDER
(4)	A(2.5, 4.5, 6.5, 8.5, 10.5, 12.5)
	B(2.5, 4.5, 6.5, 8.5, 10.5, 12.5)
	C(2.5, 4.5, 6.5, 8.5, 10.5)
	D(2.5, 4.5, 6.5, 8.5, 10.5)
	E(2.5, 4.5)
(5)	A(2.5, 4.5, 6.5, 8.5, 10.5)

Texas Department of Transportation
Bridge Division

PRESTRESSED CONCRETE I-GIRDER DESIGNS (NON-STANDARD SPANS)

IGND

TYPE Tx62 & Tx70 (3)

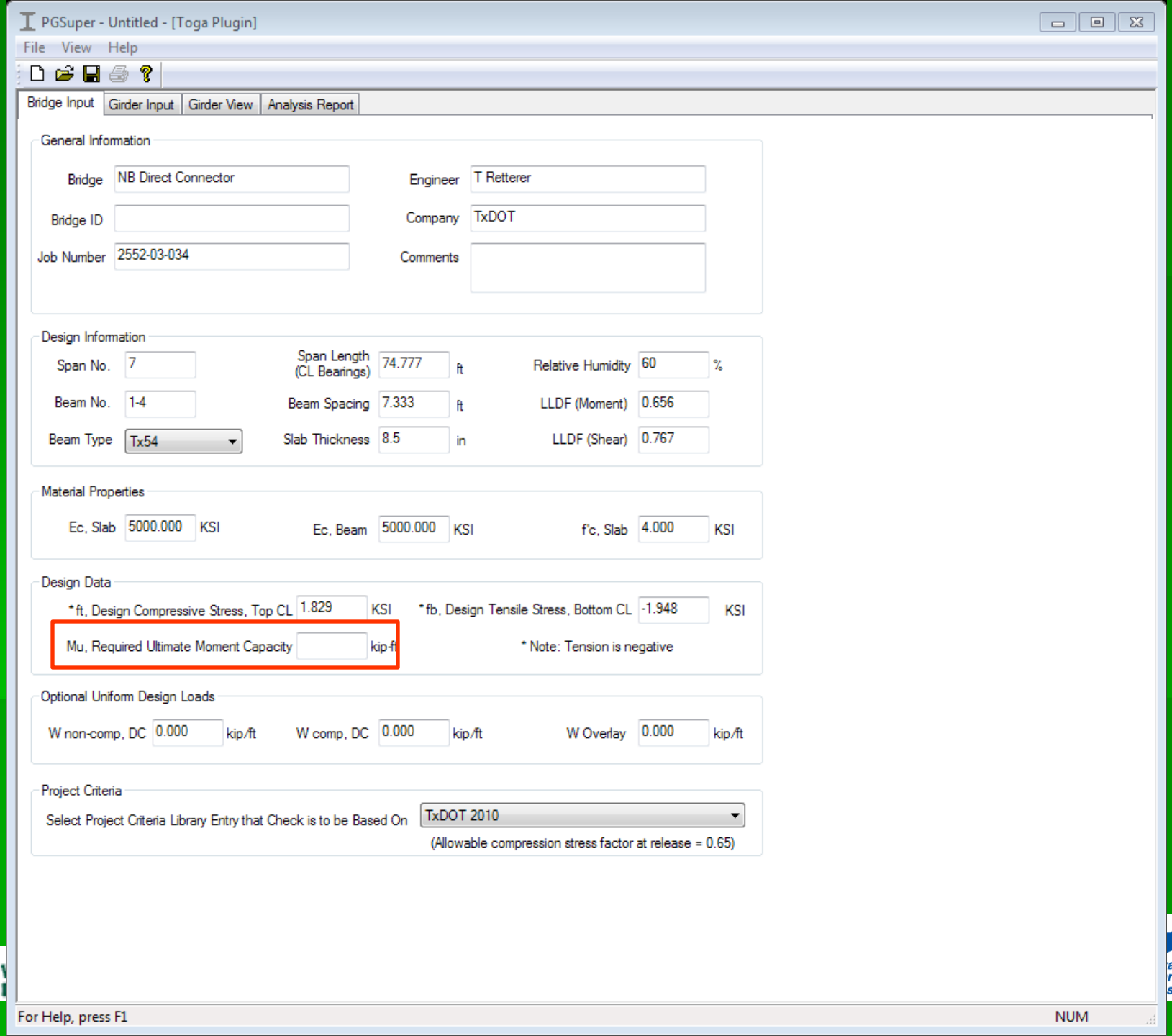
Revised 03-23-11

Nicholas Nemec 3/24/2011

Washington State Department of Transportation

PGSuper

Texas Department of Transportation


PGSuper - Untitled - [Toga Plugin]
File View Help
Bridge Input
Girder Input
Girder View
Analysis Report
General Information
Bridge
NB Direct Connector
Engineer
T Retterer
Bridge ID
Company
TxDOT
Job Number
2552-03-034
Comments
Design Information
Span No.
7
Span Length (CL Bearings)
74.777
ft
Relative Humidity
60
%
Beam No.
1-4
Beam Spacing
7.333
ft
LLDF (Moment)
0.656
Beam Type
Tx54
Slab Thickness
8.5
in
LLDF (Shear)
0.767
Material Properties
Ec, Slab
5000.000
KSI
Ec, Beam
5000.000
KSI
f'c, Slab
4.000
KSI
Design Data
*ft, Design Compressive Stress, Top CL
1.829
KSI
*fb, Design Tensile Stress, Bottom CL
-1.948
KSI
Mu, Required Ultimate Moment Capacity
kip-ft
* Note: Tension is negative
Optional Uniform Design Loads
W non-comp, DC
0.000
kip/ft
W comp, DC
0.000
kip/ft
W Overlay
0.000
kip/ft
Project Criteria
Select Project Criteria Library Entry that Check is to be Based On
TxDOT 2010
(Allowable compression stress factor at release = 0.65)
For Help, press F1
NUM

DESIGNED GIRDERS (DEPRESSED STRANDS)

STRUCTURE	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STD STRAND PATTERN	PRESTRESSING STRANDS: TOTAL NO.	SIZE (in)	STRGTH fpu (ksi)	"e" @ (in)	"e" END (in)	DEPRESSED: NO.	DEPRESSED: TO (in)	CONCRETE: RELEASE STRGTH (1) f'ci (ksi)	CONCRETE: MINIMUM 28 DAY COMP STRGTH f'c (ksi)
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	(4)	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400
	2	ALL	Tx46	(5)	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100
	3-6 & 16-20	ALL	Tx54		60	½	270	17.61	10.94	10	50.5	5.400	6.100
	7-8 & 12-13	ALL	Tx54		22	½	270	20.28	19.19	4	10.5	4.000	5.000
	14	ALL	Tx54		30	½	270	19.81	17.41	6	18.5	4.000	5.000
	15	ALL	Tx54		66	½	270	17.07	10.52	12	48.5	5.800	6.400
	21	ALL	Tx54		62	½	270	17.46	11.01	10	50.5	5.600	6.300

OPTIONAL DESIGN

STRUCTURE	SPAN NO.	GIRDER NO.	GIRDER TYPE	DESIGN LOAD COMP STRESS (TOP @) (SERVICE I) fct (ksi)	DESIGN LOAD TENSILE STRESS (BOTT @) (SERVICE III) fcb (ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (STRENGTH I) (ft-kips)	LIVE LOAD DISTRIBUTION FACTOR (2): Moment	LIVE LOAD DISTRIBUTION FACTOR (2): Shear
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	4.549	-4.394	6639	0.528	0.634
	2	ALL	Tx46	4.399	-4.255	6443	0.528	0.634
	3-6 & 16-20	ALL	Tx54	3.906	-3.944	7752	0.591	0.767
	7-8 & 12-13	ALL	Tx54	1.829	-1.948	4110	0.656	0.767
	14	ALL	Tx54	2.345	-2.479	5200	0.688	0.767
	15	ALL	Tx54	4.008	-4.128	8367	0.688	0.767
	21	ALL	Tx54	4.026	-4.058	7954	0.588	0.767

NON-STANDARD STRAND PATTERNS

PATTERN	STRAND ARRANGEMENT AT ℄ OF GIRDER
(4)	A(2.5, 4.5, 6.5, 8.5, 10.5, 12.5)
	B(2.5, 4.5, 6.5, 8.5, 10.5, 12.5)
	C(2.5, 4.5, 6.5, 8.5, 10.5)
	D(2.5, 4.5, 6.5, 8.5, 10.5)
	E(2.5, 4.5)
(5)	A(2.5, 4.5, 6.5, 8.5, 10.5)

TYPE Tx62 & Tx70(3)

Texas Department of Transportation
Bridge Division

PRESTRESSED CONCRETE I-GIRDER DESIGNS (NON-STANDARD SPANS)

IGND

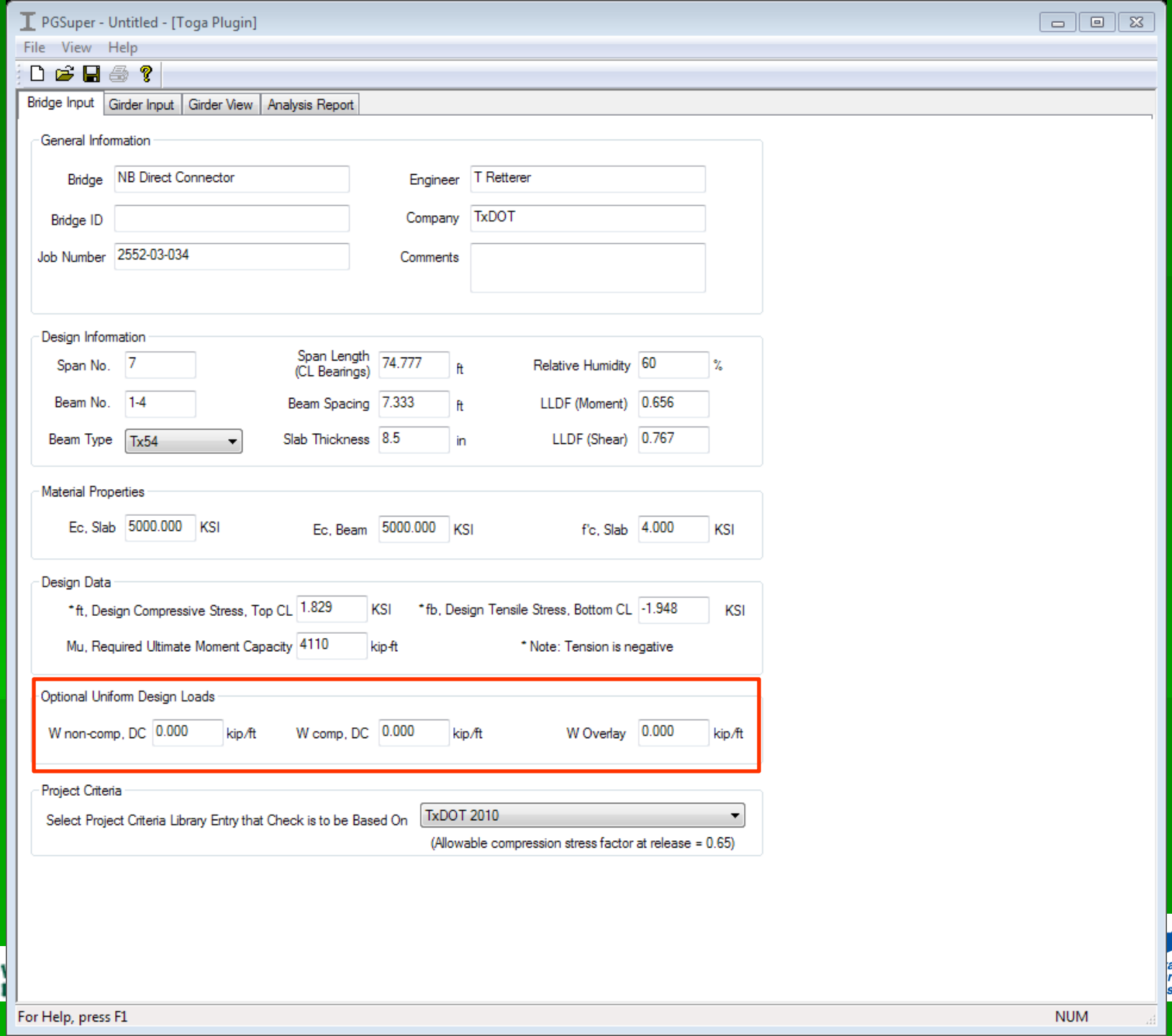
Revised 03-23-11

Nicholas Nemec 3/24/2011

Washington State Department of Transportation

PGSuper

Texas Department of Transportation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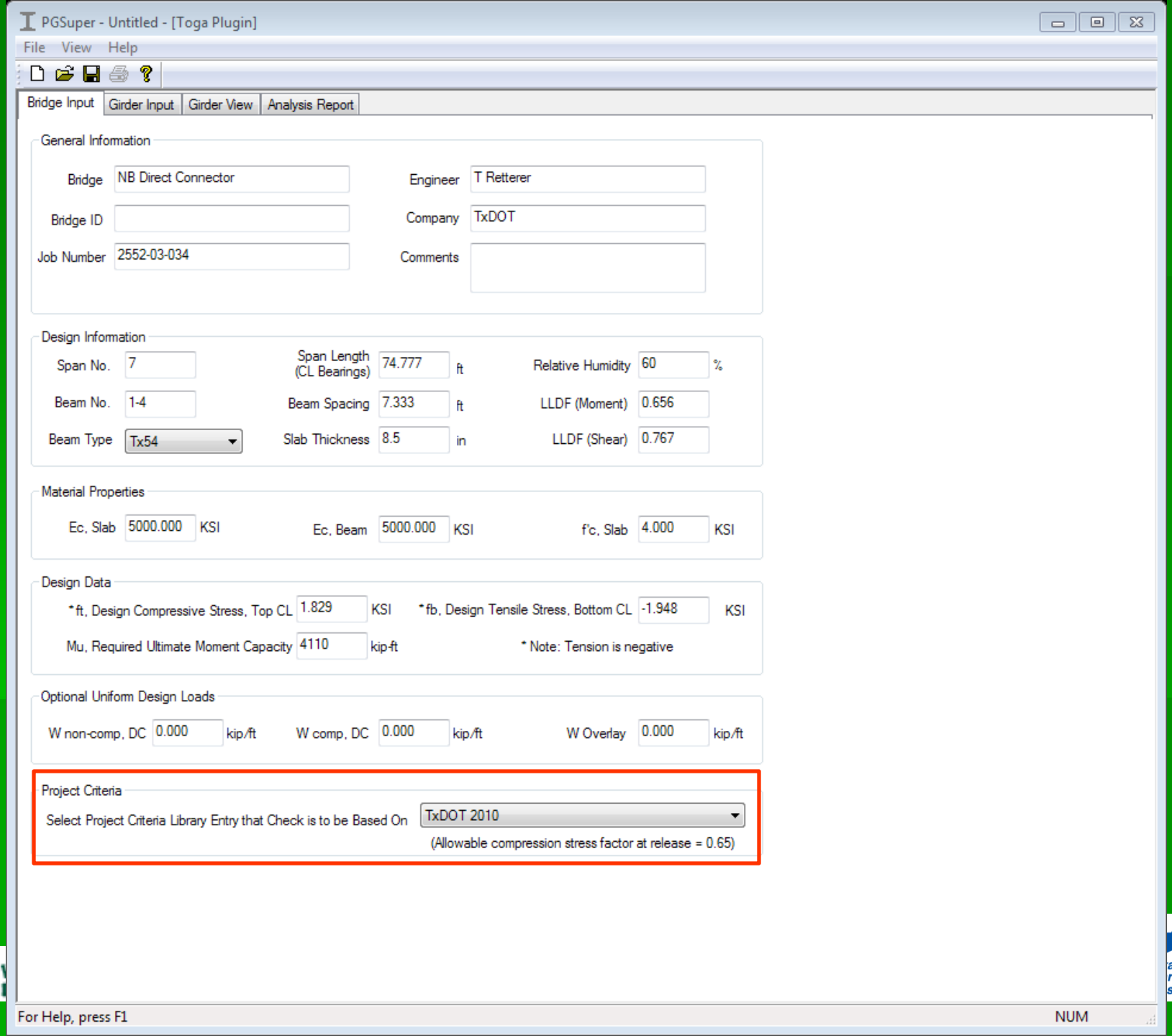
File View Help
Bridge Input
Girder Input
Girder View
Analysis Report
General Information
Bridge
NB Direct Connector
Engineer
T Retterer
Bridge ID
Company
TxDOT
Job Number
2552-03-034
Comments
Design Information
Span No.
7
Span Length (CL Bearings)
74.777
ft
Relative Humidity
60
%
Beam No.
1-4
Beam Spacing
7.333
ft
LLDF (Moment)
0.656
Beam Type
Tx54
Slab Thickness
8.5
in
LLDF (Shear)
0.767
Material Properties
Ec, Slab
5000.000
KSI
Ec, Beam
5000.000
KSI
f'c, Slab
4.000
KSI
Design Data
*ft, Design Compressive Stress, Top CL
1.829
KSI
*fb, Design Tensile Stress, Bottom CL
-1.948
KSI
Mu, Required Ultimate Moment Capacity
4110
kip-ft
* Note: Tension is negative
Optional Uniform Design Loads
W non-comp, DC
0.000
kip/ft
W comp, DC
0.000
kip/ft
W Overlay
0.000
kip/ft
Project Criteria
Select Project Criteria Library Entry that Check is to be Based On
TxDOT 2010
(Allowable compression stress factor at release = 0.65)
For Help, press F1
NUM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Bridge
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Job Number
2552-03-034
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Span No.
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Span Length (CL Bearings)
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ft
Relative Humidity
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%
Beam No.
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Beam Spacing
7.333
ft
LLDF (Moment)
0.656
Beam Type
Tx54
Slab Thickness
8.5
in
LLDF (Shear)
0.767
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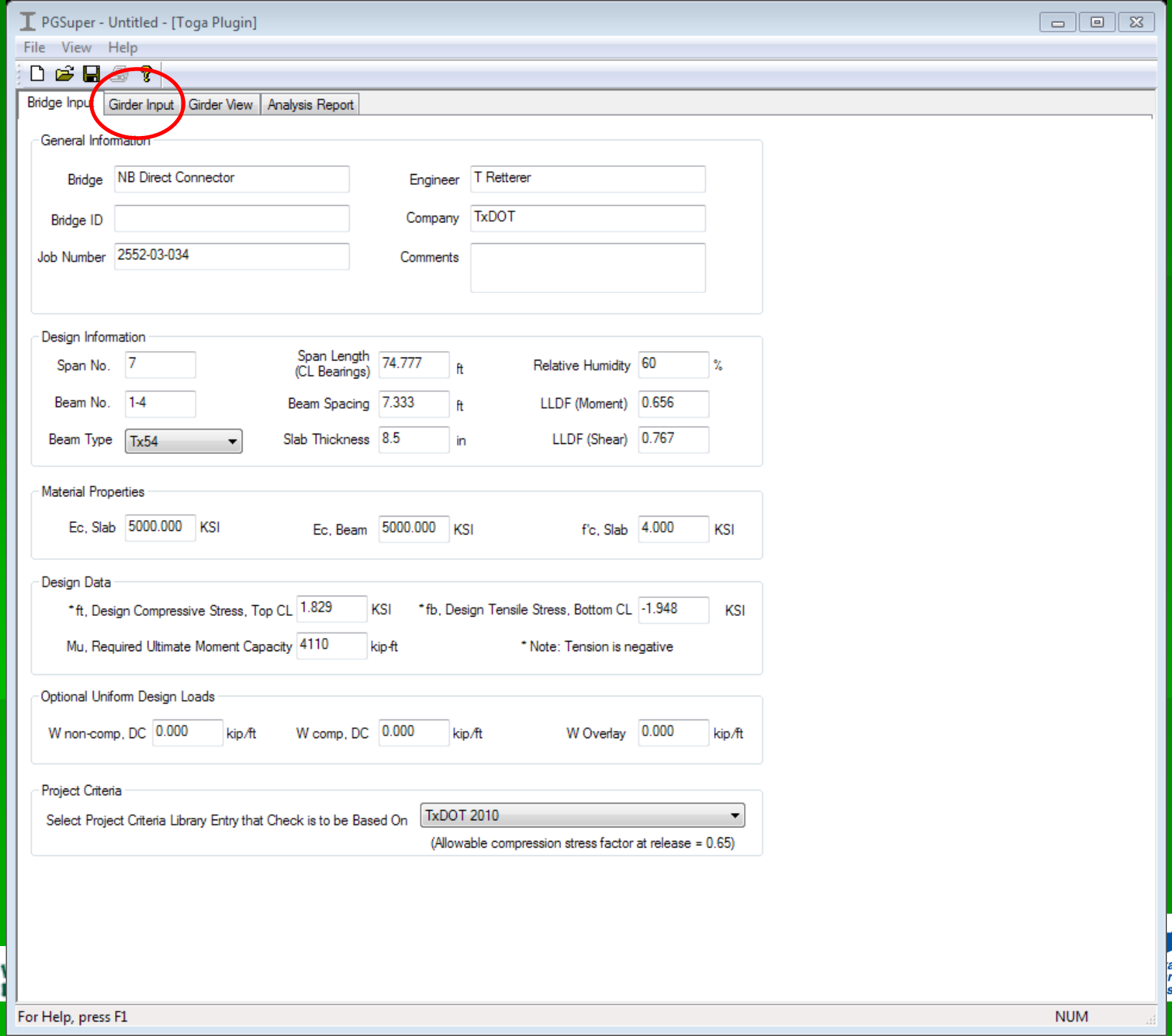
Ec, Slab
5000.000
KSI
Ec, Beam
5000.000
KSI
f'c, Slab
4.000
KSI
Design Data
*ft, Design Compressive Stress, Top CL
1.829
KSI
*fb, Design Tensile Stress, Bottom CL
-1.948
KSI
Mu, Required Ultimate Moment Capacity
4110
kip-ft
* Note: Tension is negative
Optional Uniform Design Loads
W non-comp, DC
0.000
kip/ft
W comp, DC
0.000
kip/ft
W Overlay
0.000
kip/ft
Project Criteria
Select Project Criteria Library Entry that Check is to be Based On
TxDOT 2010
(Allowable compression stress factor at release = 0.65)
For Help, press F1
NUM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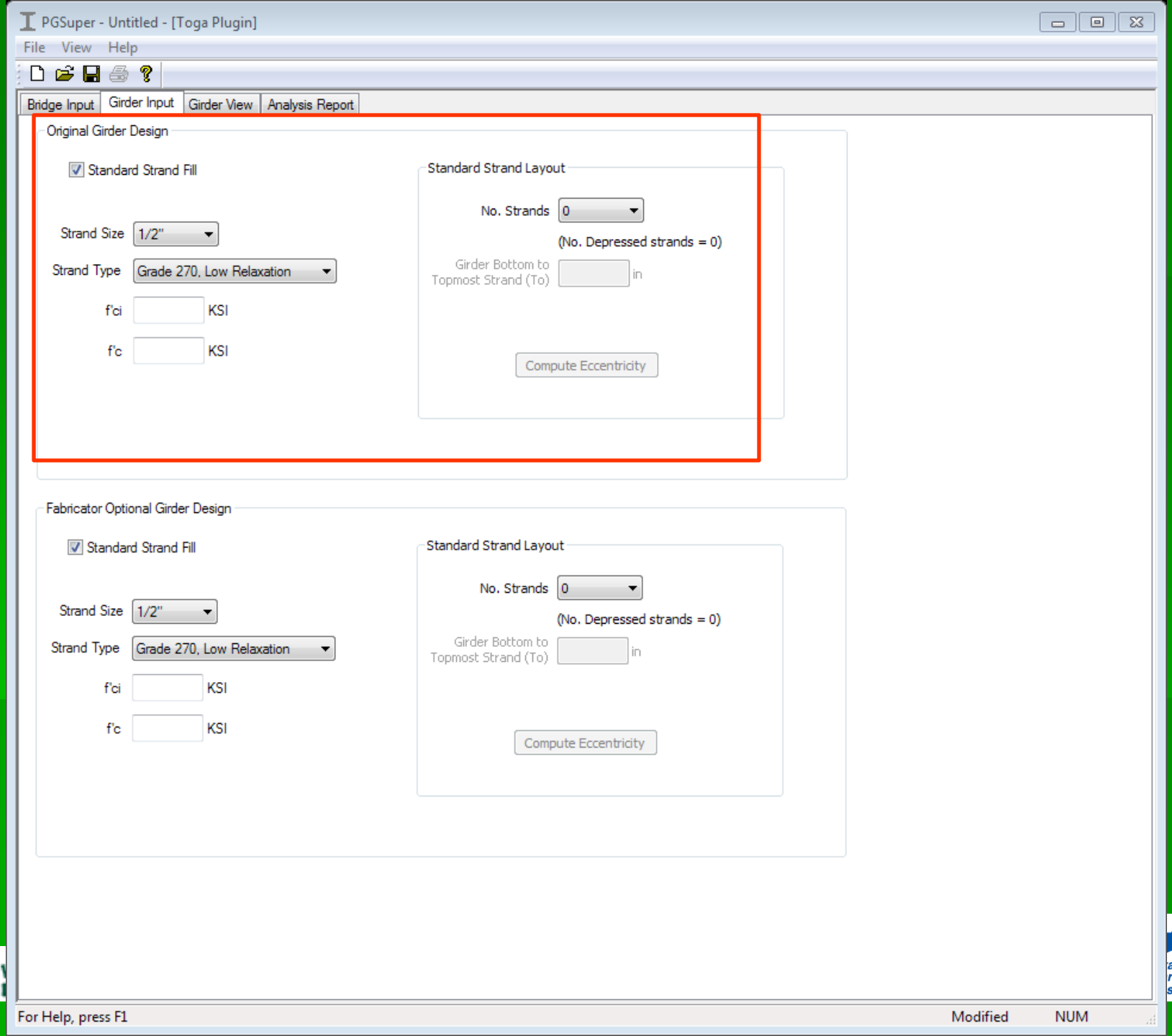
Bridge Input
Girder Input
Girder View
Analysis Report
General Information
Bridge
NB Direct Connector
Engineer
T Retterer
Bridge ID
Company
TxDOT
Job Number
2552-03-034
Comments
Design Information
Span No.
7
Span Length (CL Bearings)
74.777
ft
Relative Humidity
60
%
Beam No.
1-4
Beam Spacing
7.333
ft
LLDF (Moment)
0.656
Beam Type
Tx54
Slab Thickness
8.5
in
LLDF (Shear)
0.767
Material Properties
Ec, Slab
5000.000
KSI
Ec, Beam
5000.000
KSI
f'c, Slab
4.000
KSI
Design Data
*ft, Design Compressive Stress, Top CL
1.829
KSI
*fb, Design Tensile Stress, Bottom CL
-1.948
KSI
Mu, Required Ultimate Moment Capacity
4110
kip-ft
* Note: Tension is negative
Optional Uniform Design Loads
W non-comp, DC
0.000
kip/ft
W comp, DC
0.000
kip/ft
W Overlay
0.000
kip/ft
Project Criteria
Select Project Criteria Library Entry that Check is to be Based On
TxDOT 2010
(Allowable compression stress factor at release = 0.65)
For Help, press F1
NUM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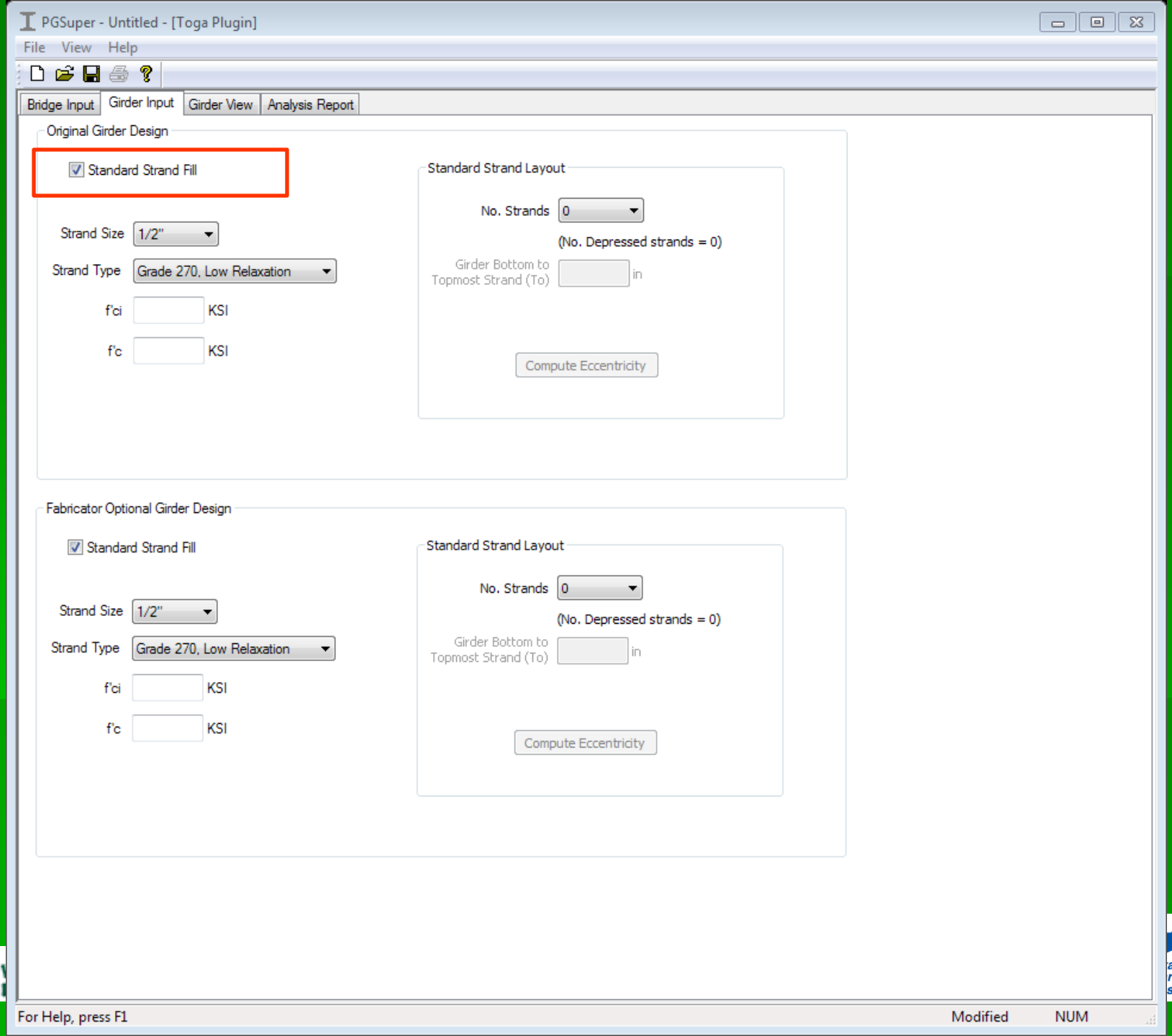
File View Help
Bridge Input Girder Input Girder View Analysis Report
Original Girder Design
Standard Strand Fill
Strand Size 1/2"
Strand Type Grade 270, Low Relaxation
f'ci KSI
f'c KSI
Standard Strand Layout
No. Strands 0
(No. Depressed strands = 0)
Girder Bottom to Topmost Strand (To) in
Compute Eccentricity
Fabricator Optional Girder Design
Standard Strand Fill
Strand Size 1/2"
Strand Type Grade 270, Low Relaxation
f'ci KSI
f'c KSI
Standard Strand Layout
No. Strands 0
(No. Depressed strands = 0)
Girder Bottom to Topmost Strand (To) in
Compute Eccentricity
For Help, press F1
Modified
NUM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File View Help
Bridge Input Girder Input Girder View Analysis Report
Original Girder Design
Standard Strand Fill
Strand Size 1/2"
Strand Type Grade 270, Low Relaxation
f'ci KSI
f'c KSI
Standard Strand Layout
No. Strands 0
(No. Depressed strands = 0)
Girder Bottom to Topmost Strand (To) in
Compute Eccentricity
Fabricator Optional Girder Design
Standard Strand Fill
Strand Size 1/2"
Strand Type Grade 270, Low Relaxation
f'ci KSI
f'c KSI
Standard Strand Layout
No. Strands 0
(No. Depressed strands = 0)
Girder Bottom to Topmost Strand (To) in
Compute Eccentricity
For Help, press F1
Modified
NUM

DESIGNED GIRDERS (DEPRESSED STRANDS)

STRUCTURE	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STD STRAND PATTERN	PRESTRESSING STRANDS: TOTAL NO.	SIZE (in)	STRGTH fpu (ksi)	"e" @ (in)	"e" END (in)	DEPRESSED: NO.	DEPRESSED: TO (in)	CONCRETE: RELEASE STRGTH (1) f'ci (ksi)	CONCRETE: MINIMUM 28 DAY COMP STRGTH f'c (ksi)
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	(4)	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400
	2	ALL	Tx46	(5)	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100
	3-6 & 16-20	ALL	Tx54		60	½	270	17.61	10.94	10	50.5	5.400	6.100
	7-8 & 12-13	ALL	Tx54		22	½	270	20.28	19.19	4	10.5	4.000	5.000
	14	ALL	Tx54		30	½	270	19.81	17.41	6	18.5	4.000	5.000
	15	ALL	Tx54		66	½	270	17.07	10.52	12	48.5	5.800	6.400
	21	ALL	Tx54		62	½	270	17.46	11.01	10	50.5	5.600	6.300

OPTIONAL DESIGN

DESIGN LOAD COMP STRESS (TOP ℄) (SERVICE I) fct (ksi)	DESIGN LOAD TENSILE STRESS (BOTT ℄) (SERVICE III) fcb (ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (STRENGTH I) (ft-kips)	LIVE LOAD DISTRIBUTION FACTOR (2) Moment	LIVE LOAD DISTRIBUTION FACTOR (2) Shear
4.549	-4.394	6639	0.528	0.634
4.399	-4.255	6443	0.528	0.634
3.906	-3.944	7752	0.591	0.767
1.829	-1.948	4110	0.656	0.767
2.345	-2.479	5200	0.688	0.767
4.008	-4.128	8367	0.688	0.767
4.026	-4.058	7954	0.588	0.767

NON-STANDARD STRAND PATTERNS

PATTERN	STRAND ARRANGEMENT AT ℄ OF GIRDER
(4)	A(2.5, 4.5, 6.5, 8.5, 10.5, 12.5)
	B(2.5, 4.5, 6.5, 8.5, 10.5, 12.5)
	C(2.5, 4.5, 6.5, 8.5, 10.5)
	D(2.5, 4.5, 6.5, 8.5, 10.5)
	E(2.5, 4.5)
(5)	A(2.5, 4.5, 6.5, 8.5, 10.5)

TYPE Tx62 & Tx70(3)

Texas Department of Transportation
Bridge Division

PRESTRESSED CONCRETE I-GIRDER DESIGNS (NON-STANDARD SPANS)

IGND

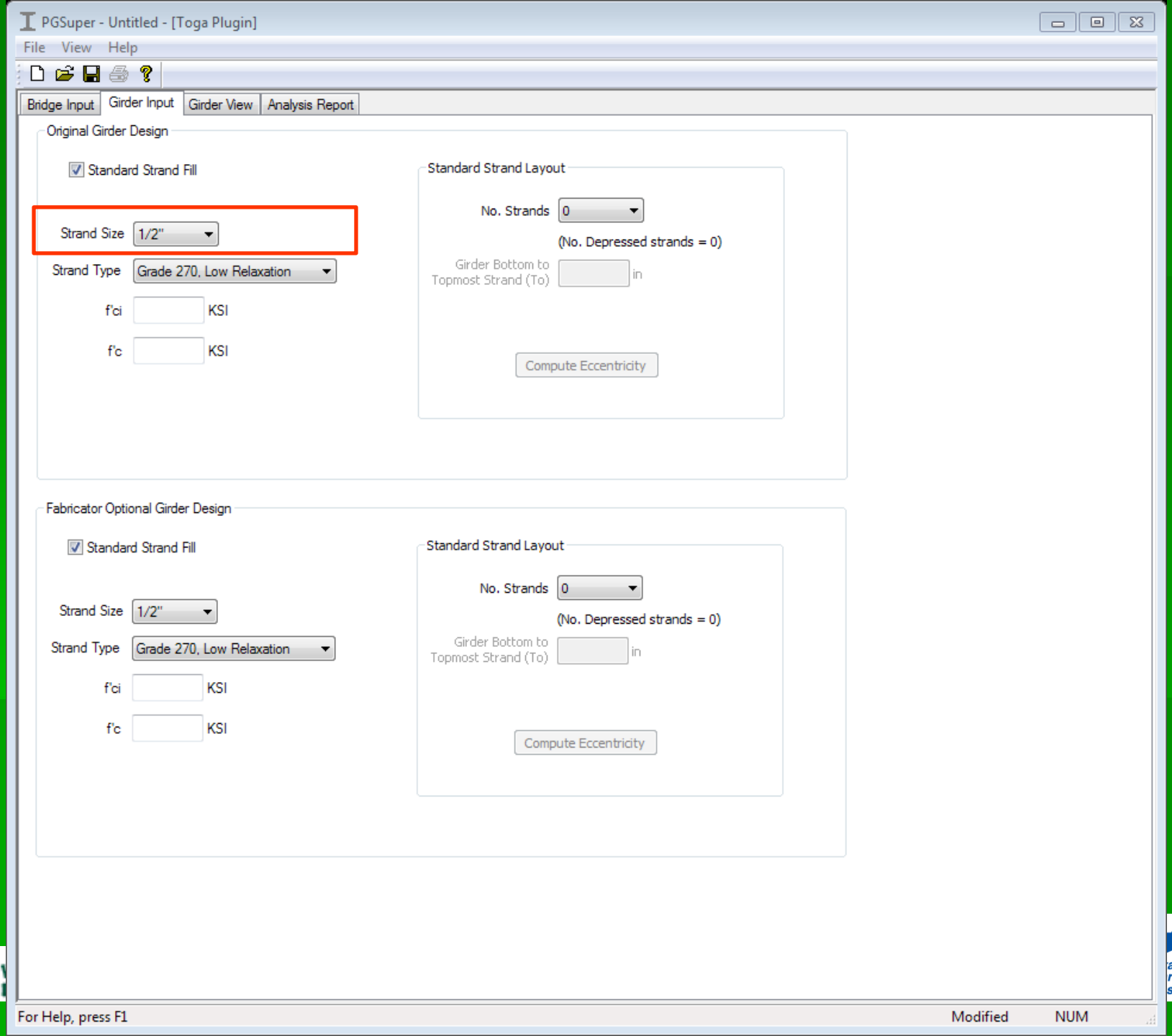
Nicholas Nemec 102288 Licensed Professional Engineer
Nicholas Nemec 3/24/2011

Revised 03-23-11

Washington State Department of Transportation

PGSuper

Texas Department of Transportation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File View Help
Bridge Input Girder Input Girder View Analysis Report
Original Girder Design
Standard Strand Fill
Strand Size 1/2"
Strand Type Grade 270, Low Relaxation
f'ci KSI
f'c KSI
Standard Strand Layout
No. Strands 0
(No. Depressed strands = 0)
Girder Bottom to Topmost Strand (To) in
Compute Eccentricity
Fabricator Optional Girder Design
Standard Strand Fill
Strand Size 1/2"
Strand Type Grade 270, Low Relaxation
f'ci KSI
f'c KSI
Standard Strand Layout
No. Strands 0
(No. Depressed strands = 0)
Girder Bottom to Topmost Strand (To) in
Compute Eccentricity
For Help, press F1
Modified
NUM

DESIGNED GIRDERS (DEPRESSED STRANDS)

STRUCTURE	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STD STRAND PATTERN	PRESTRESSING STRANDS: TOTAL NO.	SIZE (in)	STRGTH fpu (ksi)	"e" @ ℄ (in)	"e" END (in)	DEPRESSED NO.	DEPRESSED TO (in)	CONCRETE: RELEASE STRGTH (1) f'ci (ksi)	CONCRETE: MINIMUM 28 DAY COMP STRGTH f'c (ksi)
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	(4)	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400
	2	ALL	Tx46	(5)	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100
	3-6 & 16-20	ALL	Tx54		60	½	270	17.61	10.94	10	50.5	5.400	6.100
	7-8 & 12-13	ALL	Tx54		22	½	270	20.28	19.19	4	10.5	4.000	5.000
	14	ALL	Tx54		30	½	270	19.81	17.41	6	18.5	4.000	5.000
	15	ALL	Tx54		66	½	270	17.07	10.52	12	48.5	5.800	6.400
	21	ALL	Tx54		62	½	270	17.46	11.01	10	50.5	5.600	6.300

OPTIONAL DESIGN

STRUCTURE	SPAN NO.	GIRDER NO.	GIRDER TYPE	DESIGN LOAD COMP STRESS (TOP ℄) (SERVICE I) fct (ksi)	DESIGN LOAD TENSILE STRESS (BOTT ℄) (SERVICE III) fcb (ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (STRENGTH I) (ft-kips)	LIVE LOAD DISTRIBUTION FACTOR (2): Moment	LIVE LOAD DISTRIBUTION FACTOR (2): Shear
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	4.549	-4.394	6639	0.528	0.634
	2	ALL	Tx46	4.399	-4.255	6443	0.528	0.634
	3-6 & 16-20	ALL	Tx54	3.906	-3.944	7752	0.591	0.767
	7-8 & 12-13	ALL	Tx54	1.829	-1.948	4110	0.656	0.767
	14	ALL	Tx54	2.345	-2.479	5200	0.688	0.767
	15	ALL	Tx54	4.008	-4.128	8367	0.688	0.767
	21	ALL	Tx54	4.026	-4.058	7954	0.588	0.767

NON-STANDARD STRAND PATTERNS

PATTERN	STRAND ARRANGEMENT AT ℄ OF GIRDER
(4)	A(2.5, 4.5, 6.5, 8.5, 10.5, 12.5)
	B(2.5, 4.5, 6.5, 8.5, 10.5, 12.5)
	C(2.5, 4.5, 6.5, 8.5, 10.5)
	D(2.5, 4.5, 6.5, 8.5, 10.5)
	E(2.5, 4.5)
(5)	A(2.5, 4.5, 6.5, 8.5, 10.5)

Texas Department of Transportation
Bridge Division

PRESTRESSED CONCRETE I-GIRDER DESIGNS (NON-STANDARD SPANS)

IGND

TYPE Tx62 & Tx70(3)

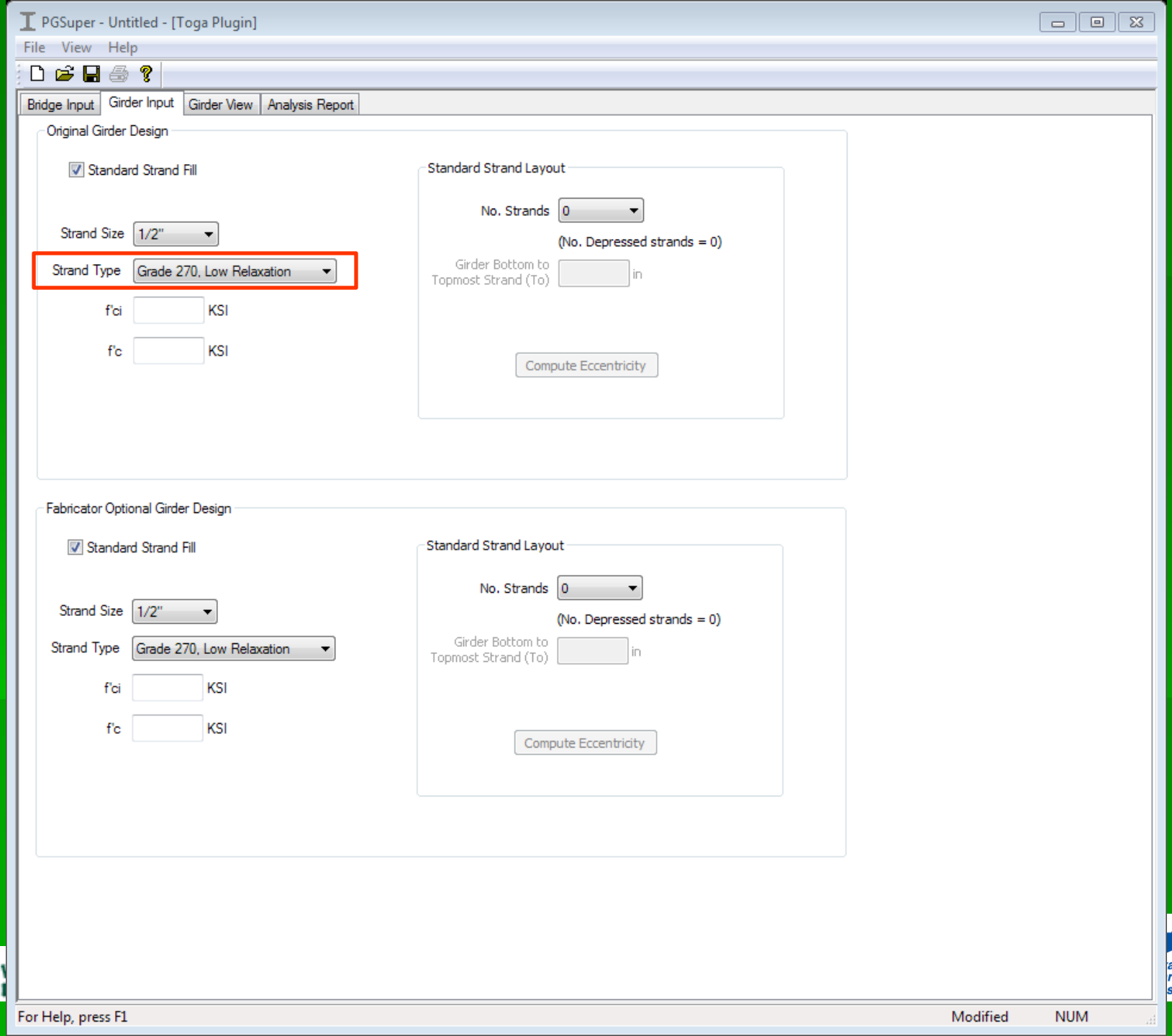
Revised 03-23-11

Nicholas Nemec 3/24/2011

Washington State Department of Transportation

PGSuper

Texas Department of Transportation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File View Help
Bridge Input Girder Input Girder View Analysis Report
Original Girder Design
Standard Strand Fill
Strand Size 1/2"
Strand Type Grade 270, Low Relaxation
f'ci KSI
f'c KSI
Standard Strand Layout
No. Strands 0
(No. Depressed strands = 0)
Girder Bottom to Topmost Strand (To) in
Compute Eccentricity
Fabricator Optional Girder Design
Standard Strand Fill
Strand Size 1/2"
Strand Type Grade 270, Low Relaxation
f'ci KSI
f'c KSI
Standard Strand Layout
No. Strands 0
(No. Depressed strands = 0)
Girder Bottom to Topmost Strand (To) in
Compute Eccentricity
For Help, press F1
Modified
NUM

DESIGNED GIRDERS (DEPRESSED STRANDS)

STRUCTURE	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STD STRAND PATTERN	PRESTRESSING STRANDS: TOTAL NO.	SIZE (in)	STRGTH fpu (ksi)	"e" @ (in)	"e" END (in)	DEPRESSED: NO.	DEPRESSED: TO (in)	CONCRETE: RELEASE STRGTH (1) f'ci (ksi)	CONCRETE: MINIMUM 28 DAY COMP STRGTH f'c (ksi)
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	(4)	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400
	2	ALL	Tx46	(5)	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100
	3-6 & 16-20	ALL	Tx54		60	½	270	17.61	10.94	10	50.5	5.400	6.100
	7-8 & 12-13	ALL	Tx54		22	½	270	20.28	19.19	4	10.5	4.000	5.000
	14	ALL	Tx54		30	½	270	19.81	17.41	6	18.5	4.000	5.000
	15	ALL	Tx54		66	½	270	17.07	10.52	12	48.5	5.800	6.400
	21	ALL	Tx54		62	½	270	17.46	11.01	10	50.5	5.600	6.300

OPTIONAL DESIGN

STRUCTURE	SPAN NO.	GIRDER NO.	GIRDER TYPE	DESIGN LOAD COMP STRESS (TOP @) (SERVICE I) fct (ksi)	DESIGN LOAD TENSILE STRESS (BOTT @) (SERVICE III) fcb (ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (STRENGTH I) (ft-kips)	LIVE LOAD DISTRIBUTION FACTOR (2): Moment	LIVE LOAD DISTRIBUTION FACTOR (2): Shear
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	4.549	-4.394	6639	0.528	0.634
	2	ALL	Tx46	4.399	-4.255	6443	0.528	0.634
	3-6 & 16-20	ALL	Tx54	3.906	-3.944	7752	0.591	0.767
	7-8 & 12-13	ALL	Tx54	1.829	-1.948	4110	0.656	0.767
	14	ALL	Tx54	2.345	-2.479	5200	0.688	0.767
	15	ALL	Tx54	4.008	-4.128	8367	0.688	0.767
	21	ALL	Tx54	4.026	-4.058	7954	0.588	0.767

NON-STANDARD STRAND PATTERNS

PATTERN	STRAND ARRANGEMENT AT ℄ OF GIRDER
(4)	A(2.5, 4.5, 6.5, 8.5, 10.5, 12.5)
	B(2.5, 4.5, 6.5, 8.5, 10.5, 12.5)
	C(2.5, 4.5, 6.5, 8.5, 10.5)
	D(2.5, 4.5, 6.5, 8.5, 10.5)
	E(2.5, 4.5)
(5)	A(2.5, 4.5, 6.5, 8.5, 10.5)

Texas Department of Transportation
Bridge Division

PRESTRESSED CONCRETE I-GIRDER DESIGNS (NON-STANDARD SPANS)

IGND

TYPE Tx62 & Tx70 (3)

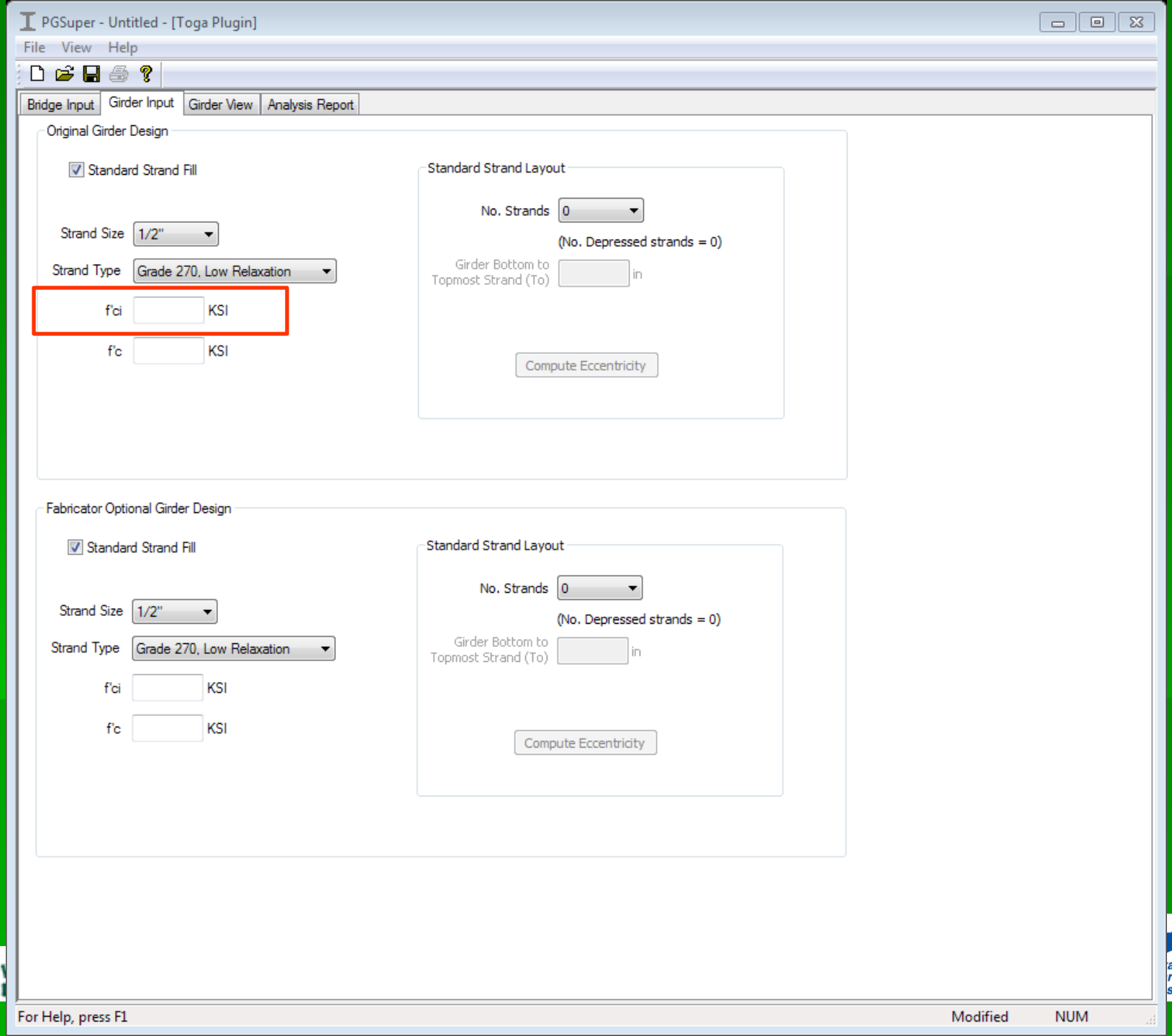
Revised 03-23-11

Nicholas Nemec 3/24/2011

Washington State Department of Transportation

PGSuper

Texas Department of Transportation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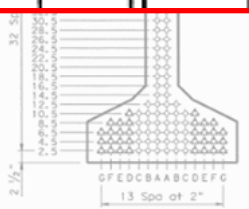
File View Help
Bridge Input Girder Input Girder View Analysis Report
Original Girder Design
Standard Strand Fill
Strand Size 1/2"
Strand Type Grade 270, Low Relaxation
f'ci KSI
f'c KSI
Standard Strand Layout
No. Strands 0
(No. Depressed strands = 0)
Girder Bottom to Topmost Strand (To) in
Compute Eccentricity
Fabricator Optional Girder Design
Standard Strand Fill
Strand Size 1/2"
Strand Type Grade 270, Low Relaxation
f'ci KSI
f'c KSI
Standard Strand Layout
No. Strands 0
(No. Depressed strands = 0)
Girder Bottom to Topmost Strand (To) in
Compute Eccentricity
For Help, press F1
Modified
NUM

DESIGNED GIRDERS (DEPRESSED STRANDS)

STRUCTURE	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STD STRAND PATTERN	PRESTRESSING STRANDS: TOTAL NO.	SIZE (in)	STRGTH fpu (ksi)	"e" @ ℄ (in)	"e" @ END (in)	DEPRESSED: NO.	DEPRESSED: TO (in)	CONCRETE: RELEASE STRGTH (1) f'ci (ksi)	CONCRETE: MINIMUM 28 DAY COMP STRGTH f'c (ksi)
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	(4)	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400
	2	ALL	Tx46	(5)	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100
	3-6 & 16-20	ALL	Tx54		60	½	270	17.61	10.94	10	50.5	5.400	6.100
	7-8 & 12-13	ALL	Tx54		22	½	270	20.28	19.19	4	10.5	4.000	5.000
	14	ALL	Tx54		30	½	270	19.81	17.41	6	18.5	4.000	5.000
	15	ALL	Tx54		66	½	270	17.07	10.52	12	48.5	5.800	6.400
	21	ALL	Tx54		62	½	270	17.46	11.01	10	50.5	5.600	6.300

OPTIONAL DESIGN

STRUCTURE	SPAN NO.	GIRDER NO.	GIRDER TYPE	DESIGN LOAD COMP STRESS (TOP ℄) (SERVICE I) fct (ksi)	DESIGN LOAD TENSILE STRESS (BOTT ℄) (SERVICE III) fcb (ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (STRENGTH I) (ft-kips)	LIVE LOAD DISTRIBUTION FACTOR (2): Moment	LIVE LOAD DISTRIBUTION FACTOR (2): Shear
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	4.549	-4.394	6639	0.528	0.634
	2	ALL	Tx46	4.399	-4.255	6443	0.528	0.634
	3-6 & 16-20	ALL	Tx54	3.906	-3.944	7752	0.591	0.767
	7-8 & 12-13	ALL	Tx54	1.829	-1.948	4110	0.656	0.767
	14	ALL	Tx54	2.345	-2.479	5200	0.688	0.767
	15	ALL	Tx54	4.008	-4.128	8367	0.688	0.767
	21	ALL	Tx54	4.026	-4.058	7954	0.588	0.767



Texas Department of Transportation
Bridge Division

PRESTRESSED CONCRETE I-GIRDER DESIGNS (NON-STANDARD SPANS)

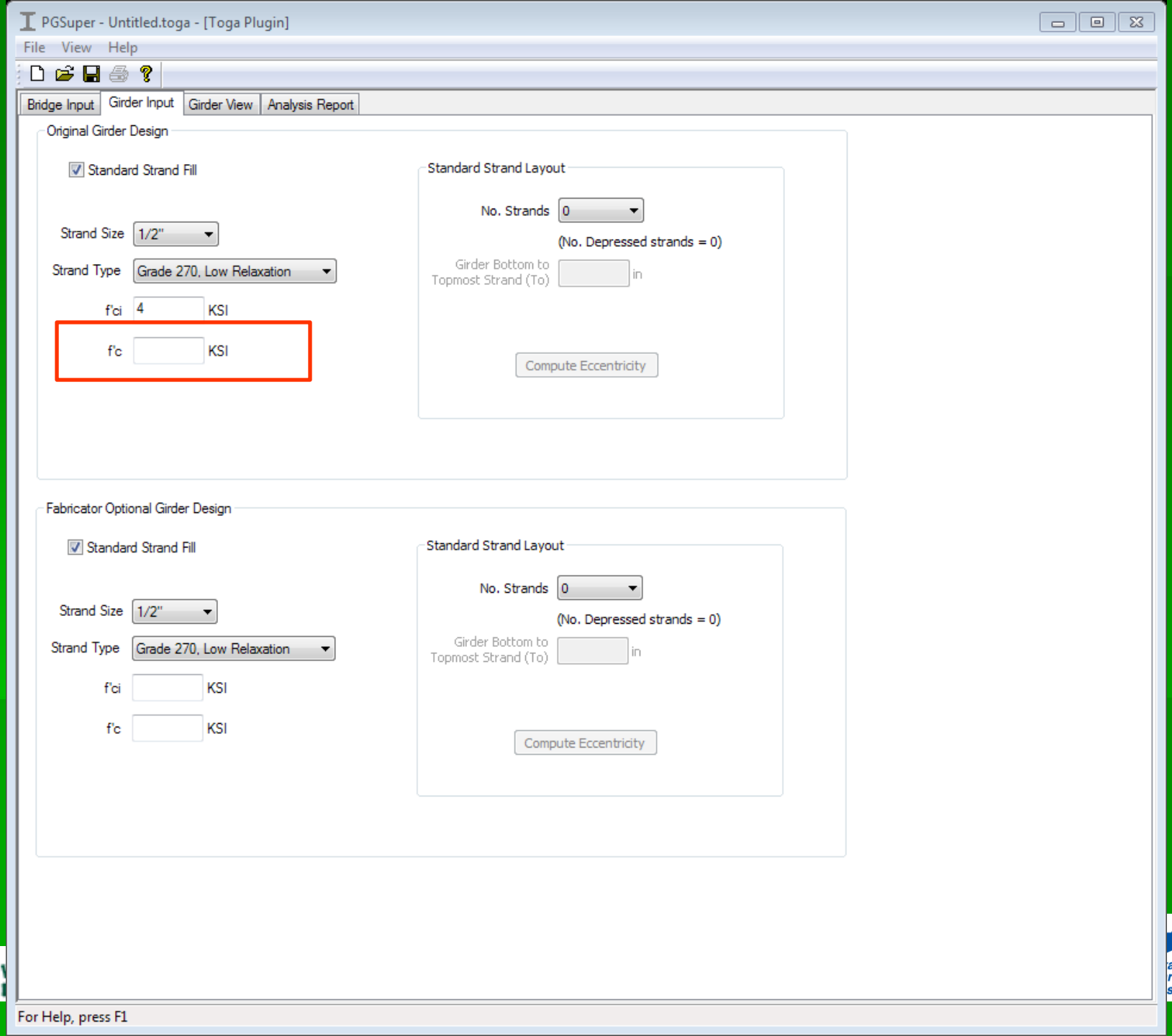
IGND

Revised 03-23-11

Washington State Department of Transportation

PGSuper

Texas Department of Transportation


PGSuper - Untitled.toga - [Toga Plugin]
File View Help
Bridge Input
Girder Input
Girder View
Analysis Report
Original Girder Design
Standard Strand Fill
Strand Size 1/2"
Strand Type Grade 270, Low Relaxation
f'ci 4 KSI
f'c KSI
Standard Strand Layout
No. Strands 0
(No. Depressed strands = 0)
Girder Bottom to Topmost Strand (To) in
Compute Eccentricity
Fabricator Optional Girder Design
Standard Strand Fill
Strand Size 1/2"
Strand Type Grade 270, Low Relaxation
f'ci KSI
f'c KSI
Standard Strand Layout
No. Strands 0
(No. Depressed strands = 0)
Girder Bottom to Topmost Strand (To) in
Compute Eccentricity
For Help, press F1

DESIGNED GIRDERS (DEPRESSED STRANDS)

STRUCTURE	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STD STRAND PATTERN	PRESTRESSING STRANDS: TOTAL NO.	SIZE (in)	STRGTH fpu (ksi)	"e" @ ℄ (in)	"e" @ END (in)	DEPRESSED: NO.	DEPRESSED: TO (in)	CONCRETE: RELEASE STRGTH ① f'ci (ksi)	CONCRETE: MINIMUM 28 DAY COMP STRGTH f'c (ksi)
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	④	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400
	2	ALL	Tx46	⑤	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100
	3-6 & 16-20	ALL	Tx54		60	½	270	17.61	10.94	10	50.5	5.400	6.100
	7-8 & 12-13	ALL	Tx54		22	½	270	20.28	19.19	4	10.5	4.000	5.000
	14	ALL	Tx54		30	½	270	19.81	17.41	6	18.5	4.000	5.000
	15	ALL	Tx54		66	½	270	17.07	10.52	12	48.5	5.800	6.400
	21	ALL	Tx54		62	½	270	17.46	11.01	10	50.5	5.600	6.300

OPTIONAL DESIGN

DESIGN LOAD COMP STRESS (TOP ℄) (SERVICE I) fct (ksi)	DESIGN LOAD TENSILE STRESS (BOTT ℄) (SERVICE III) fcb (ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (STRENGTH I) (ft-kips)	LIVE LOAD DISTRIBUTION FACTOR ② Moment	LIVE LOAD DISTRIBUTION FACTOR ② Shear
4.549	-4.394	6639	0.528	0.634
4.399	-4.255	6443	0.528	0.634
3.906	-3.944	7752	0.591	0.767
1.829	-1.948	4110	0.656	0.767
2.345	-2.479	5200	0.688	0.767
4.008	-4.128	8367	0.688	0.767
4.026	-4.058	7954	0.588	0.767

NON-STANDARD STRAND PATTERNS

PATTERN	STRAND ARRANGEMENT AT ℄ OF GIRDER
④	A(2.5, 4.5, 6.5, 8.5, 10.5, 12.5)
	B(2.5, 4.5, 6.5, 8.5, 10.5, 12.5)
	C(2.5, 4.5, 6.5, 8.5, 10.5)
	D(2.5, 4.5, 6.5, 8.5, 10.5)
	E(2.5, 4.5)
⑤	A(2.5, 4.5, 6.5, 8.5, 10.5)

TYPE Tx62 & Tx70③

Texas Department of Transportation
Bridge Division

PRESTRESSED CONCRETE I-GIRDER DESIGNS (NON-STANDARD SPANS)

IGND

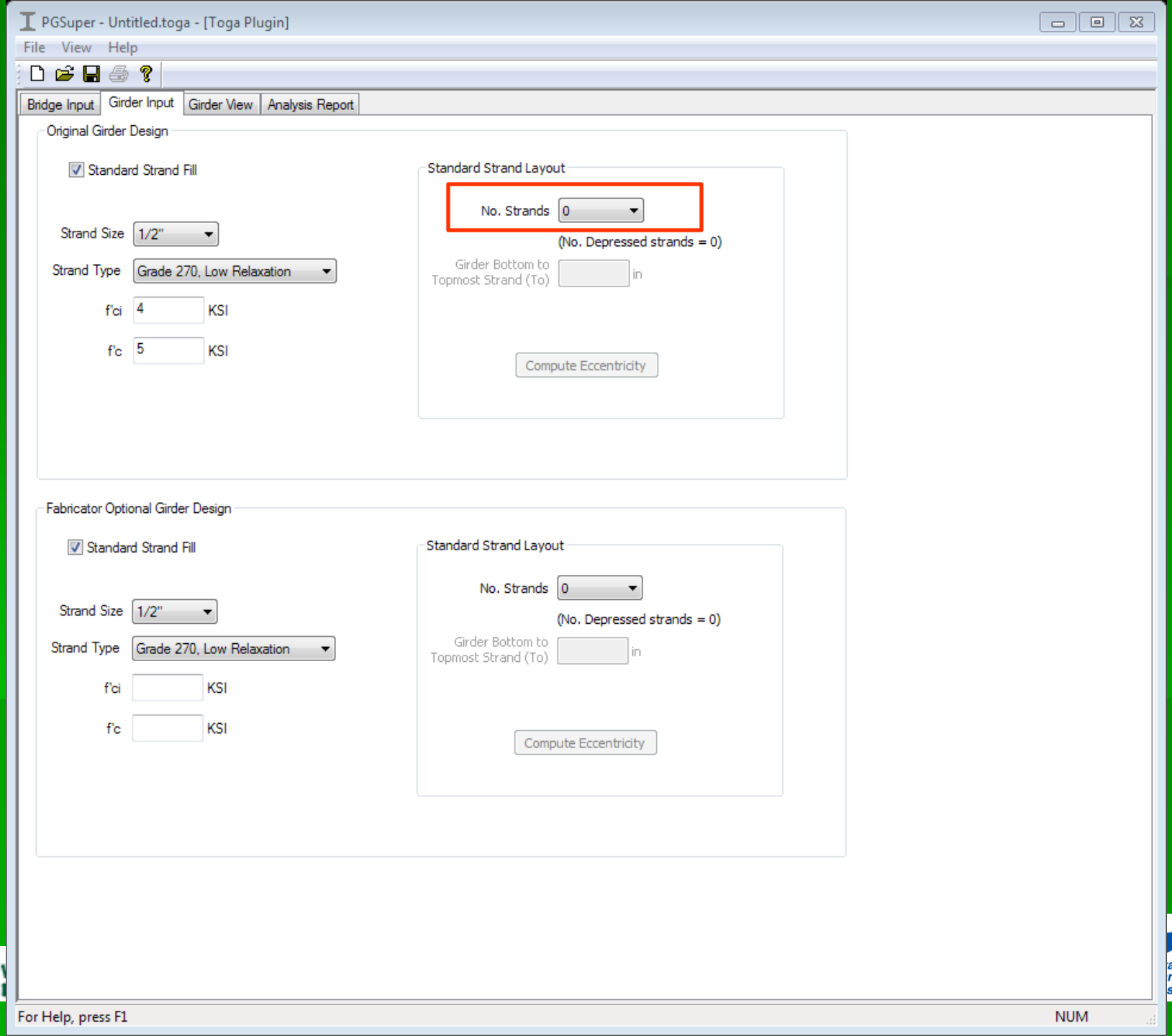
Nicholas Nemec 3/24/2011

Revised 03-23-11

Washington State Department of Transportation

PGSuper

Texas Department of Transportation


PGSuper - Untitled.toga - [Toga Plugin]
File View Help
Bridge Input Girder Input Girder View Analysis Report
Original Girder Design
Standard Strand Fill
Strand Size 1/2"
Strand Type Grade 270, Low Relaxation
f'ci 4 KSI
f'c 5 KSI
Standard Strand Layout
No. Strands 0
(No. Depressed strands = 0)
Girder Bottom to Topmost Strand (To) in
Compute Eccentricity
Fabricator Optional Girder Design
Standard Strand Fill
Strand Size 1/2"
Strand Type Grade 270, Low Relaxation
f'ci KSI
f'c KSI
Standard Strand Layout
No. Strands 0
(No. Depressed strands = 0)
Girder Bottom to Topmost Strand (To) in
Compute Eccentricity
For Help, press F1
NUM

DESIGNED GIRDERS (DEPRESSED STRANDS)

STRUCTURE	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STD STRAND PATTERN	PRESTRESSING STRANDS TOTAL NO.	PRESTRESSING STRANDS SIZE (in)	PRESTRESSING STRANDS STRGTH fpu (ksi)	PRESTRESSING STRANDS "e" ℄ (in)	PRESTRESSING STRANDS "e" END (in)	PRESTRESSING STRANDS DEPRESSED NO.	PRESTRESSING STRANDS DEPRESSED TO (in)	CONCRETE RELEASE STRGTH ① f'ci (ksi)	CONCRETE MINIMUM 28 DAY COMP STRGTH f'c (ksi)	OPTIONAL DESIGN DESIGN LOAD COMP STRESS (TOP ℄) (SERVICE I) fct (ksi)	OPTIONAL DESIGN DESIGN LOAD TENSILE STRESS (BOTT ℄) (SERVICE III) fcb (ksi)	OPTIONAL DESIGN REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (STRENGTH I) (ft-kips)	OPTIONAL DESIGN LIVE LOAD DISTRIBUTION FACTOR ② Moment	OPTIONAL DESIGN LIVE LOAD DISTRIBUTION FACTOR ② Shear
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	④	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400	4.549	-4.394	6639	0.528	0.634
	2	ALL	Tx46	⑤	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100	4.399	-4.255	6443	0.528	0.634
	3-6 & 16-20	ALL	Tx54		60	½	270	17.61	10.94	10	50.5	5.400	6.100	3.906	-3.944	7752	0.591	0.767
	7-8 & 12-13	ALL	Tx54		22	½	270	20.28	19.19	4	10.5	4.000	5.000	1.829	-1.948	4110	0.656	0.767
	14	ALL	Tx54		30	½	270	19.81	17.41	6	18.5	4.000	5.000	2.345	-2.479	5200	0.688	0.767
	15	ALL	Tx54		66	½	270	17.07	10.52	12	48.5	5.800	6.400	4.008	-4.128	8367	0.688	0.767
	21	ALL	Tx54		62	½	270	17.46	11.01	10	50.5	5.600	6.300	4.026	-4.058	7954	0.588	0.767

NON-STANDARD STRAND PATTERNS

PATTERN	STRAND ARRANGEMENT AT ℄ OF GIRDER
④	A(2.5, 4.5, 6.5, 8.5, 10.5, 12.5)
	B(2.5, 4.5, 6.5, 8.5, 10.5, 12.5)
	C(2.5, 4.5, 6.5, 8.5, 10.5)
	D(2.5, 4.5, 6.5, 8.5, 10.5)
	E(2.5, 4.5)
⑤	A(2.5, 4.5, 6.5, 8.5, 10.5)

TYPE Tx62 & Tx70③

Texas Department of Transportation
Bridge Division

PRESTRESSED CONCRETE I-GIRDER DESIGNS (NON-STANDARD SPANS)

IGND

Nicholas Nemec 3/24/2011

Revised 03-23-11

Washington State Department of Transportation

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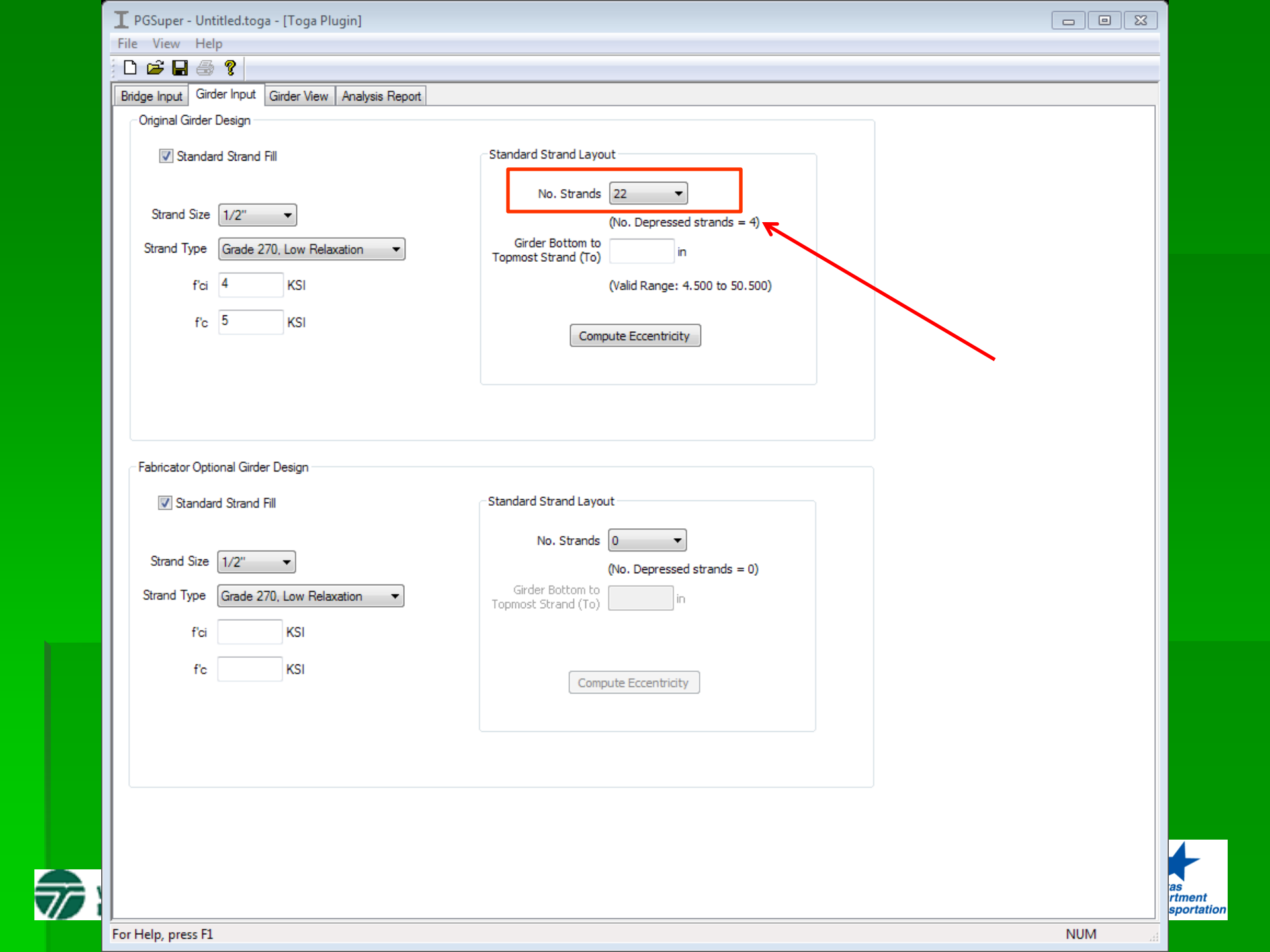
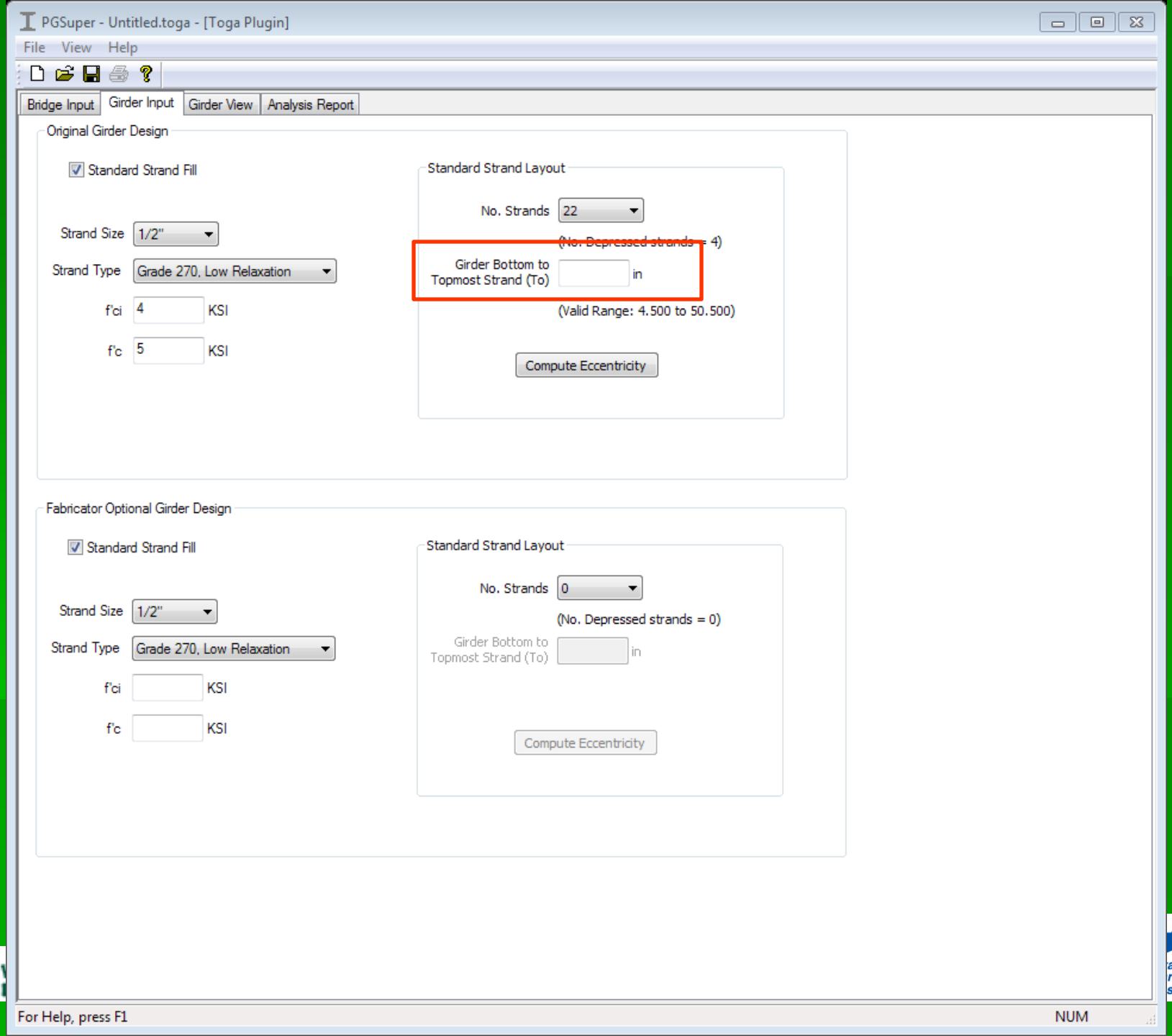

PGSuper - Untitled.toga - [Toga Plugin]
File View Help
Bridge Input
Girder Input
Girder View
Analysis Report
Original Girder Design
Standard Strand Fill
Strand Size 1/2"
Strand Type Grade 270, Low Relaxation
f'ci 4 KSI
f'c 5 KSI
Standard Strand Layout
No. Strands 22
(No. Depressed strands = 4)
Girder Bottom to Topmost Strand (To) in
(Valid Range: 4.500 to 50.500)
Compute Eccentricity
Fabricator Optional Girder Design
Standard Strand Fill
Strand Size 1/2"
Strand Type Grade 270, Low Relaxation
f'ci KSI
f'c KSI
Standard Strand Layout
No. Strands 0
(No. Depressed strands = 0)
Girder Bottom to Topmost Strand (To) in
Compute Eccentricity
For Help, press F1
NUM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File View Help
Bridge Input
Girder Input
Girder View
Analysis Report
Original Girder Design
Standard Strand Fill
Strand Size 1/2"
Strand Type Grade 270, Low Relaxation
f'ci 4 KSI
f'c 5 KSI
Standard Strand Layout
No. Strands 22
(No. Depressed strands = 4)
Girder Bottom to Topmost Strand (To) in
(Valid Range: 4.500 to 50.500)
Compute Eccentricity
Fabricator Optional Girder Design
Standard Strand Fill
Strand Size 1/2"
Strand Type Grade 270, Low Relaxation
f'ci KSI
f'c KSI
Standard Strand Layout
No. Strands 0
(No. Depressed strands = 0)
Girder Bottom to Topmost Strand (To) in
Compute Eccentricity
For Help, press F1
NUM

DESIGNED GIRDERS (DEPRESSED STRANDS)

STRUCTURE	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STD STRAND PATTERN	PRESTRESSING STRANDS: TOTAL NO.	SIZE (in)	STRGTH fpu (ksi)	"e" @ (in)	"e" END (in)	DEPRESSED: NO.	DEPRESSED: TO (in)	CONCRETE: RELEASE STRGTH (1) f'ci (ksi)	CONCRETE: MINIMUM 28 DAY COMP STRGTH f'c (ksi)
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	(4)	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400
	2	ALL	Tx46	(5)	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100
	3-6 & 16-20	ALL	Tx54		60	½	270	17.61	10.94	10	50.5	5.400	6.100
	7-8 & 12-13	ALL	Tx54		22	½	270	20.28	19.19	4	10.5	4.000	5.000
	14	ALL	Tx54		30	½	270	19.81	17.41	6	18.5	4.000	5.000
	15	ALL	Tx54		66	½	270	17.07	10.52	12	48.5	5.800	6.400
	21	ALL	Tx54		62	½	270	17.46	11.01	10	50.5	5.600	6.300

OPTIONAL DESIGN

STRUCTURE	SPAN NO.	GIRDER NO.	GIRDER TYPE	DESIGN LOAD COMP STRESS (TOP @) (SERVICE I) fct (ksi)	DESIGN LOAD TENSILE STRESS (BOTT @) (SERVICE III) fcb (ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (STRENGTH I) (ft-kips)	LIVE LOAD DISTRIBUTION FACTOR (2): Moment	LIVE LOAD DISTRIBUTION FACTOR (2): Shear
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	4.549	-4.394	6639	0.528	0.634
	2	ALL	Tx46	4.399	-4.255	6443	0.528	0.634
	3-6 & 16-20	ALL	Tx54	3.906	-3.944	7752	0.591	0.767
	7-8 & 12-13	ALL	Tx54	1.829	-1.948	4110	0.656	0.767
	14	ALL	Tx54	2.345	-2.479	5200	0.688	0.767
	15	ALL	Tx54	4.008	-4.128	8367	0.688	0.767
	21	ALL	Tx54	4.026	-4.058	7954	0.588	0.767

NON-STANDARD STRAND PATTERNS

PATTERN	STRAND ARRANGEMENT AT ℄ OF GIRDER
(4)	A(2.5, 4.5, 6.5, 8.5, 10.5, 12.5)
	B(2.5, 4.5, 6.5, 8.5, 10.5, 12.5)
	C(2.5, 4.5, 6.5, 8.5, 10.5)
	D(2.5, 4.5, 6.5, 8.5, 10.5)
	E(2.5, 4.5)
(5)	A(2.5, 4.5, 6.5, 8.5, 10.5)

TYPE Tx62 & Tx70(3)

Texas Department of Transportation
Bridge Division

PRESTRESSED CONCRETE I-GIRDER DESIGNS (NON-STANDARD SPANS)

IGND

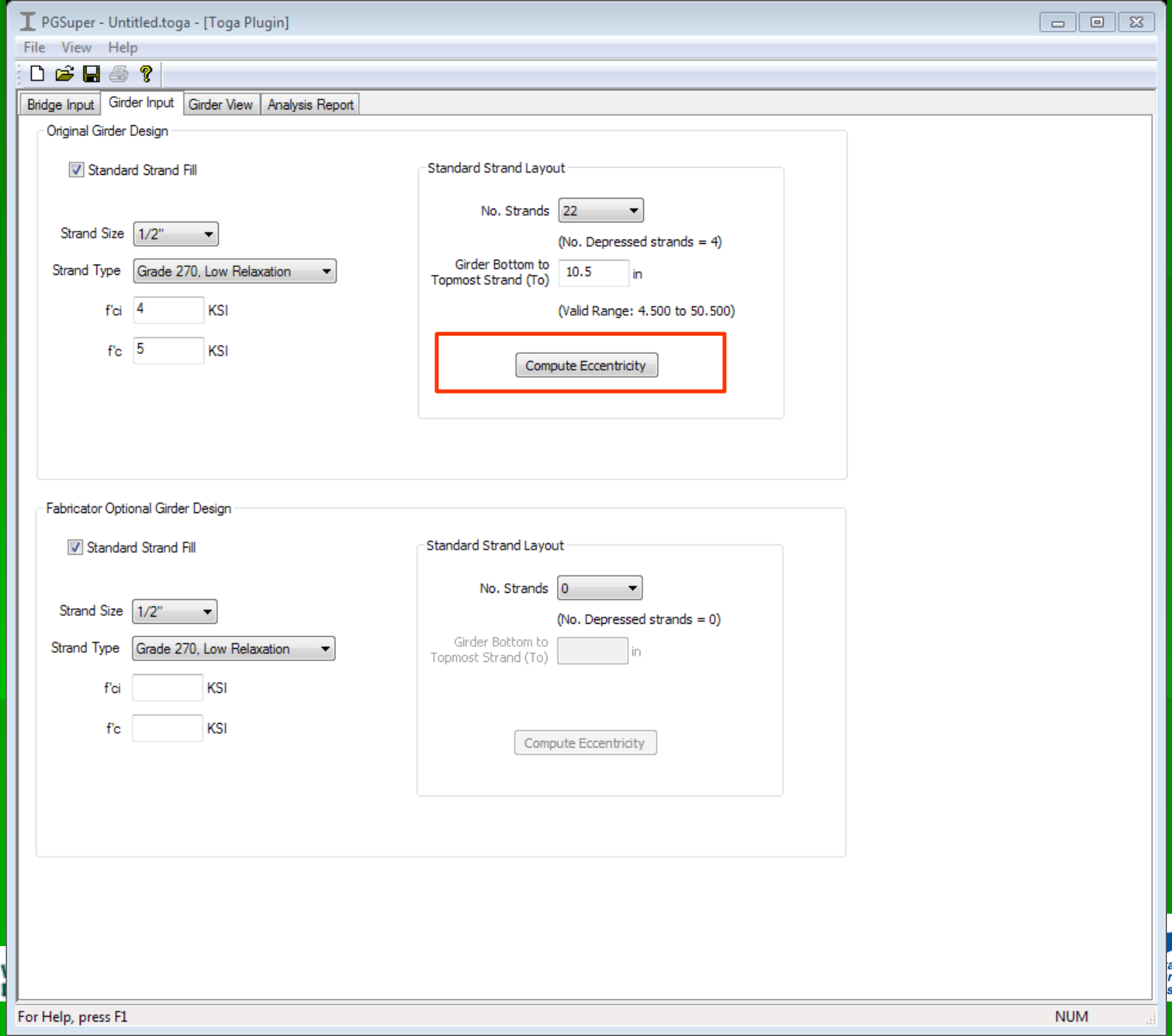
Nicholas Nemec 3/24/2011

Revised 03-23-11

Washington State Department of Transportation

PGSuper

Texas Department of Transportation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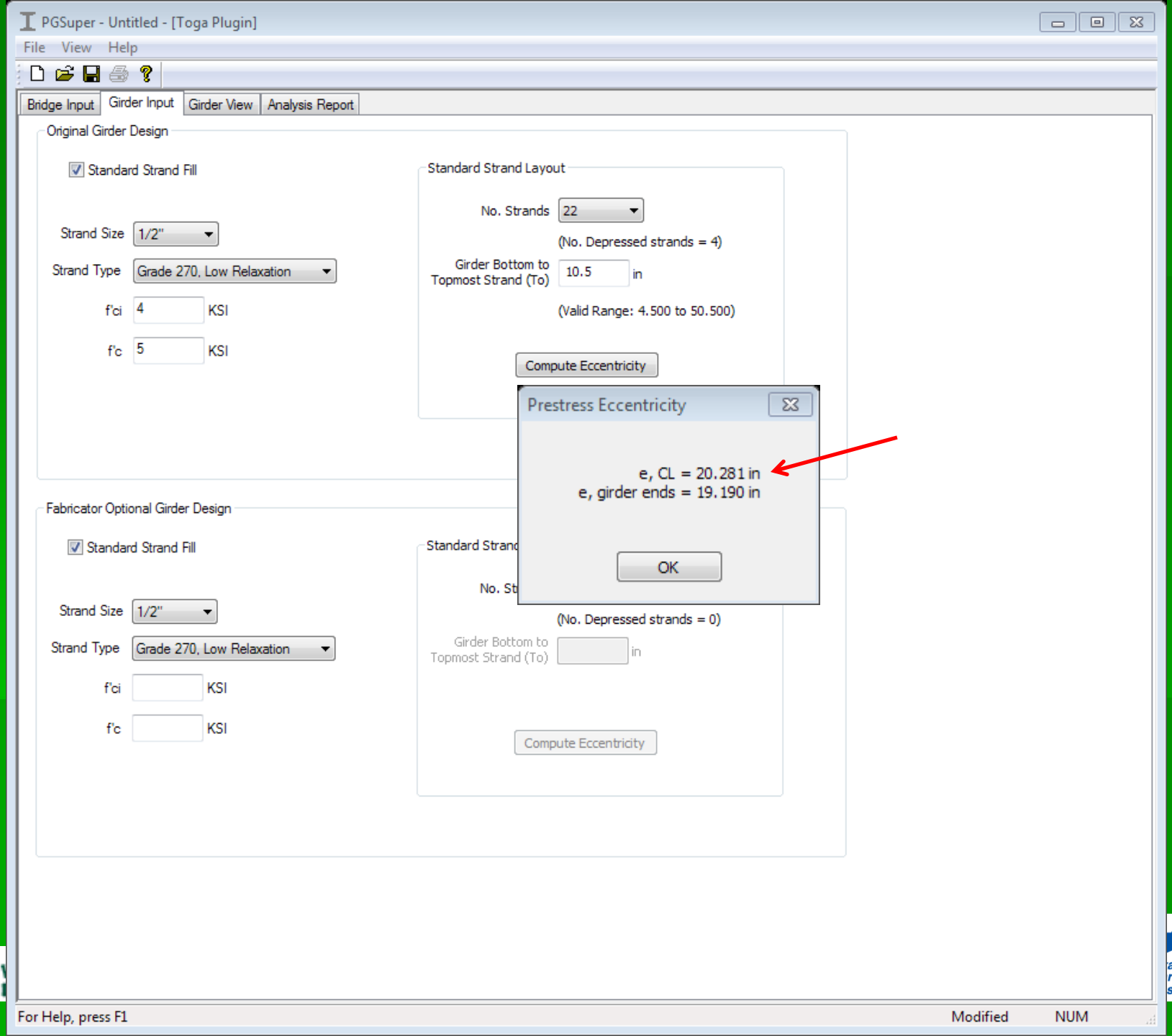
Girder Input
Girder View
Analysis Report
Original Girder Design
Standard Strand Fill
Strand Size 1/2"
Strand Type Grade 270, Low Relaxation
f'ci 4 KSI
f'c 5 KSI
Standard Strand Layout
No. Strands 22
(No. Depressed strands = 4)
Girder Bottom to Topmost Strand (To) 10.5 in
(Valid Range: 4.500 to 50.500)
Compute Eccentricity
Fabricator Optional Girder Design
Standard Strand Fill
Strand Size 1/2"
Strand Type Grade 270, Low Relaxation
f'ci KSI
f'c KSI
Standard Strand Layout
No. Strands 0
(No. Depressed strands = 0)
Girder Bottom to Topmost Strand (To) in
Compute Eccentricity
For Help, press F1
NUM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Original Girder Design
Standard Strand Fill
Strand Size 1/2"
Strand Type Grade 270, Low Relaxation
f'ci 4 KSI
f'c 5 KSI
Standard Strand Layout
No. Strands 22
(No. Depressed strands = 4)
Girder Bottom to Topmost Strand (To) 10.5 in
(Valid Range: 4.500 to 50.500)
Compute Eccentricity
Prestress Eccentricity
e, CL = 20.281 in
e, girder ends = 19.190 in
OK
Fabricator Optional Girder Design
Standard Strand Fill
Strand Size 1/2"
Strand Type Grade 270, Low Relaxation
f'ci KSI
f'c KSI
(No. Depressed strands = 0)
Girder Bottom to Topmost Strand (To) in
Compute Eccentricity
For Help, press F1
Modified
NUM

DESIGNED GIRDERS (DEPRESSED STRANDS)

STRUCTURE	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STD STRAND PATTERN	PRESTRESSING STRANDS: TOTAL NO.	SIZE (in)	STRGTH fpu (ksi)	"e" @ (in)	"e" END (in)	DEPRESSED: NO.	DEPRESSED: TO (in)	CONCRETE: RELEASE STRGTH (1) f'ci (ksi)	CONCRETE: MINIMUM 28 DAY COMP STRGTH f'c (ksi)
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	(4)	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400
	2	ALL	Tx46	(5)	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100
	3-6 & 16-20	ALL	Tx54		60	½	270	17.61	10.94	10	50.5	5.400	6.100
	7-8 & 12-13	ALL	Tx54		22	½	270	20.28	19.19	4	10.5	4.000	5.000
	14	ALL	Tx54		30	½	270	19.81	17.41	6	18.5	4.000	5.000
	15	ALL	Tx54		66	½	270	17.07	10.52	12	48.5	5.800	6.400
	21	ALL	Tx54		62	½	270	17.46	11.01	10	50.5	5.600	6.300

OPTIONAL DESIGN

STRUCTURE	SPAN NO.	GIRDER NO.	GIRDER TYPE	DESIGN LOAD COMP STRESS (TOP @) (SERVICE I) fct (ksi)	DESIGN LOAD TENSILE STRESS (BOTT @) (SERVICE III) fcb (ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (STRENGTH I) (ft-kips)	LIVE LOAD DISTRIBUTION FACTOR (2): Moment	LIVE LOAD DISTRIBUTION FACTOR (2): Shear
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	4.549	-4.394	6639	0.528	0.634
	2	ALL	Tx46	4.399	-4.255	6443	0.528	0.634
	3-6 & 16-20	ALL	Tx54	3.906	-3.944	7752	0.591	0.767
	7-8 & 12-13	ALL	Tx54	1.829	-1.948	4110	0.656	0.767
	14	ALL	Tx54	2.345	-2.479	5200	0.688	0.767
	15	ALL	Tx54	4.008	-4.128	8367	0.688	0.767
	21	ALL	Tx54	4.026	-4.058	7954	0.588	0.767

TYPE Tx62 & Tx70(3)

Texas Department of Transportation
Bridge Division

PRESTRESSED CONCRETE I-GIRDER DESIGNS (NON-STANDARD SPANS)

IGND

Nicholas Nemec 3/24/2011

Revised 03-23-11

Washington State Department of Transportation

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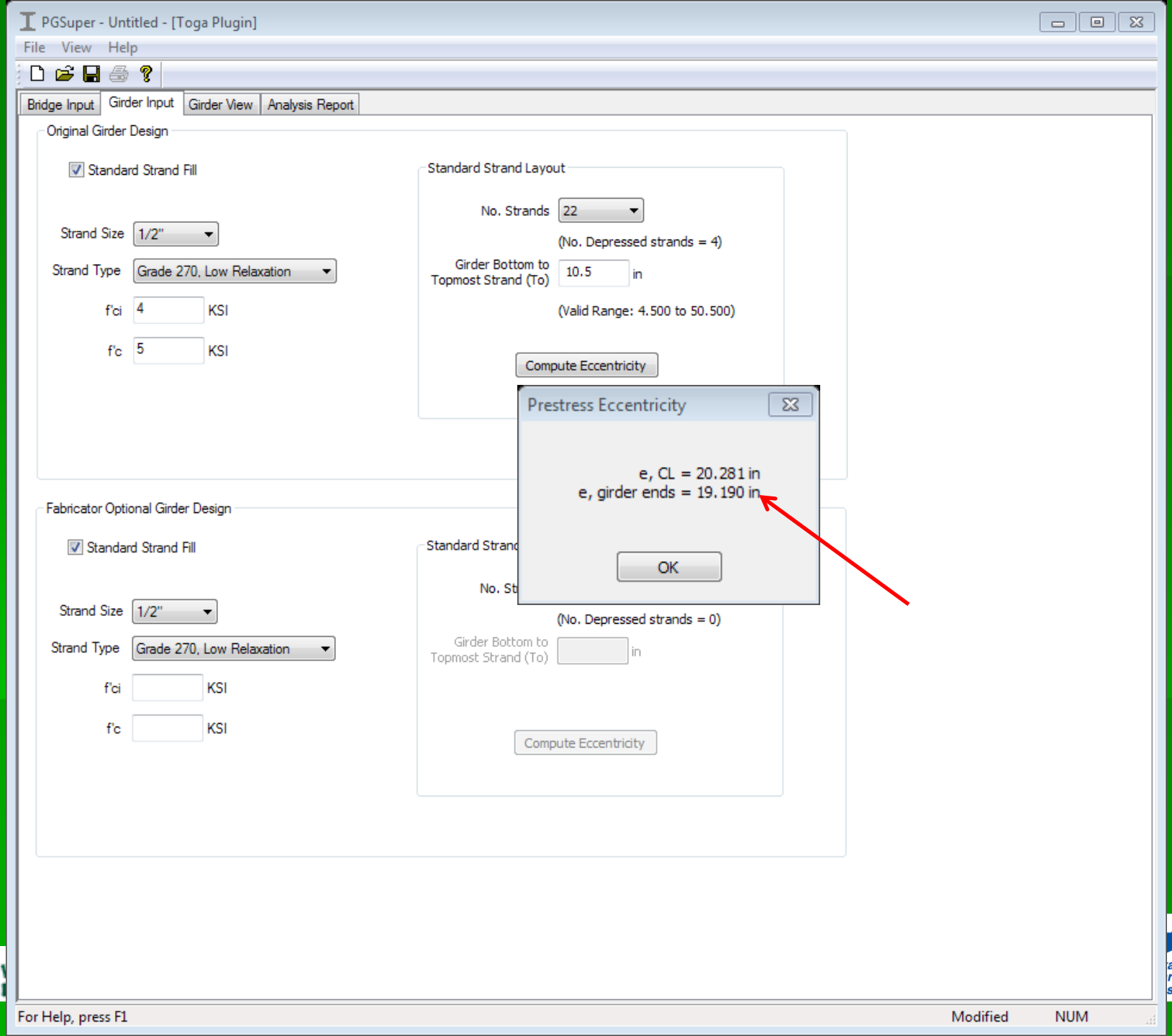
Texas Department of Transportation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File View Help
Bridge Input Girder Input Girder View Analysis Report
Original Girder Design
Standard Strand Fill
Strand Size 1/2"
Strand Type Grade 270, Low Relaxation
f'ci 4 KSI
f'c 5 KSI
Standard Strand Layout
No. Strands 22
(No. Depressed strands = 4)
Girder Bottom to Topmost Strand (To) 10.5 in
(Valid Range: 4.500 to 50.500)
Compute Eccentricity
Prestress Eccentricity
e, CL = 20.281 in
e, girder ends = 19.190 in
OK
Fabricator Optional Girder Design
Standard Strand Fill
Strand Size 1/2"
Strand Type Grade 270, Low Relaxation
f'ci KSI
f'c KSI
(No. Depressed strands = 0)
Girder Bottom to Topmost Strand (To) in
Compute Eccentricity
For Help, press F1
Modified
NUM

DESIGNED GIRDERS (DEPRESSED STRANDS)

STRUCTURE	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STD STRAND PATTERN	PRESTRESSING STRANDS: TOTAL NO.	SIZE (in)	STRGTH fpu (ksi)	"e" @ ℄ (in)	"e" @ END (in)	DEPRESSED: NO.	DEPRESSED: TO (in)	CONCRETE: RELEASE STRGTH (1) f'ci (ksi)	CONCRETE: MINIMUM 28 DAY COMP STRGTH f'c (ksi)
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	(4)	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400
	2	ALL	Tx46	(5)	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100
	3-6 & 16-20	ALL	Tx54		60	½	270	17.61	10.94	10	50.5	5.400	6.100
	7-8 & 12-13	ALL	Tx54		22	½	270	20.28	19.19	4	10.5	4.000	5.000
	14	ALL	Tx54		30	½	270	19.81	17.41	6	18.5	4.000	5.000
	15	ALL	Tx54		66	½	270	17.07	10.52	12	48.5	5.800	6.400
	21	ALL	Tx54		62	½	270	17.46	11.01	10	50.5	5.600	6.300

OPTIONAL DESIGN

DESIGN LOAD COMP STRESS (TOP ℄) (SERVICE I) fcd (ksi)	DESIGN LOAD TENSILE STRESS (BOTT ℄) (SERVICE III) fcb (ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (STRENGTH I) (ft-kips)	LIVE LOAD DISTRIBUTION FACTOR (2): Moment	LIVE LOAD DISTRIBUTION FACTOR (2): Shear
4.549	-4.394	6639	0.528	0.634
4.399	-4.255	6443	0.528	0.634
3.906	-3.944	7752	0.591	0.767
1.829	-1.948	4110	0.656	0.767
2.345	-2.479	5200	0.688	0.767
4.008	-4.128	8367	0.688	0.767
4.026	-4.058	7954	0.588	0.767

NON-STANDARD STRAND PATTERNS

PATTERN	STRAND ARRANGEMENT AT ℄ OF GIRDER
(4)	A(2.5, 4.5, 6.5, 8.5, 10.5, 12.5)
	B(2.5, 4.5, 6.5, 8.5, 10.5, 12.5)
	C(2.5, 4.5, 6.5, 8.5, 10.5)
	D(2.5, 4.5, 6.5, 8.5, 10.5)
	E(2.5, 4.5)
(5)	A(2.5, 4.5, 6.5, 8.5, 10.5)

TYPE Tx62 & Tx70 (3)

Texas Department of Transportation
Bridge Division

PRESTRESSED CONCRETE I-GIRDER DESIGNS (NON-STANDARD SPANS)

IGND

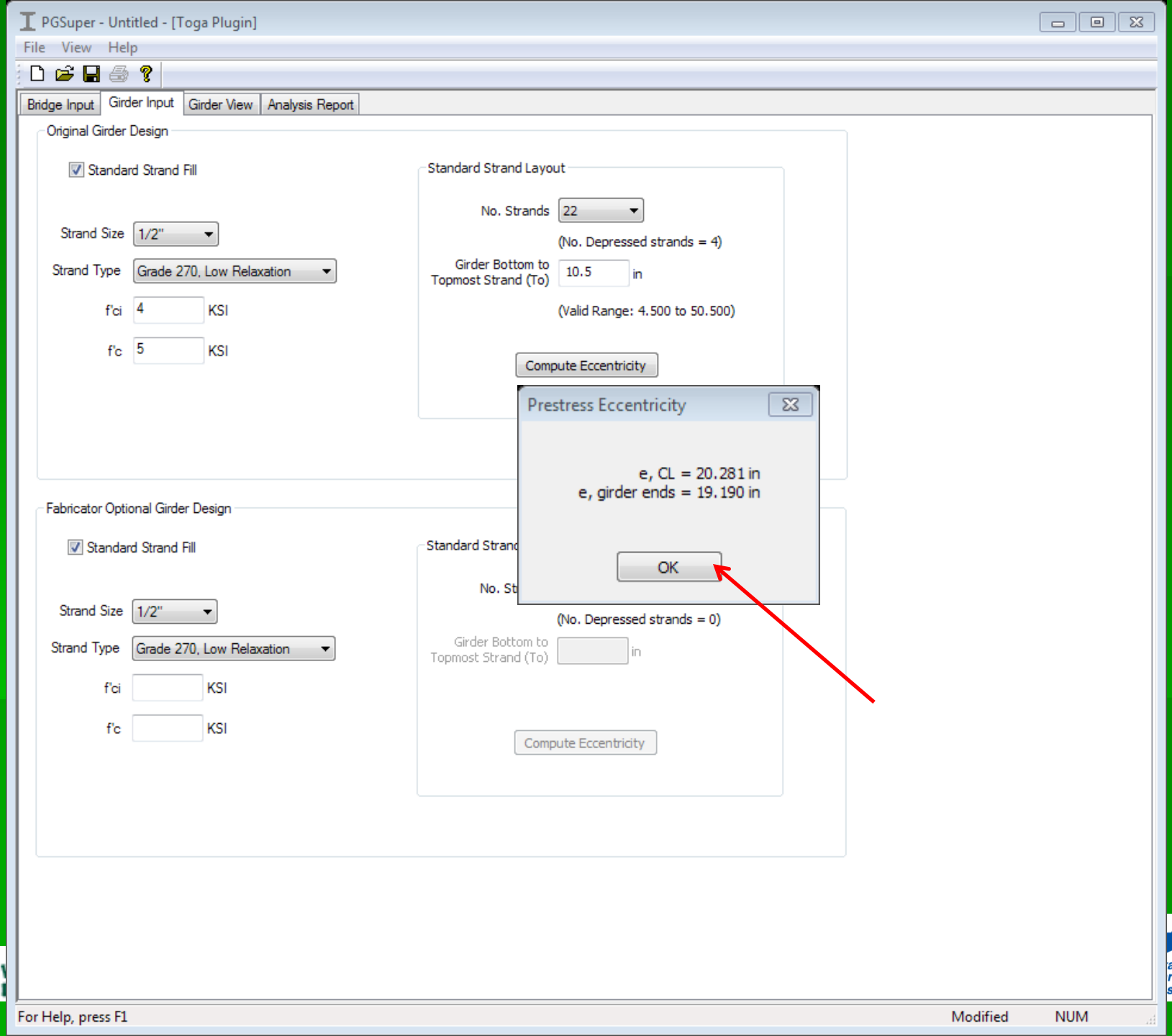
Nicholas Nemec 102288 Licensed Professional Engineer
Nicholas Nemec 3/24/2011

Revised 03-23-11

Washington State Department of Transportation

PGSuper

Texas Department of Transportation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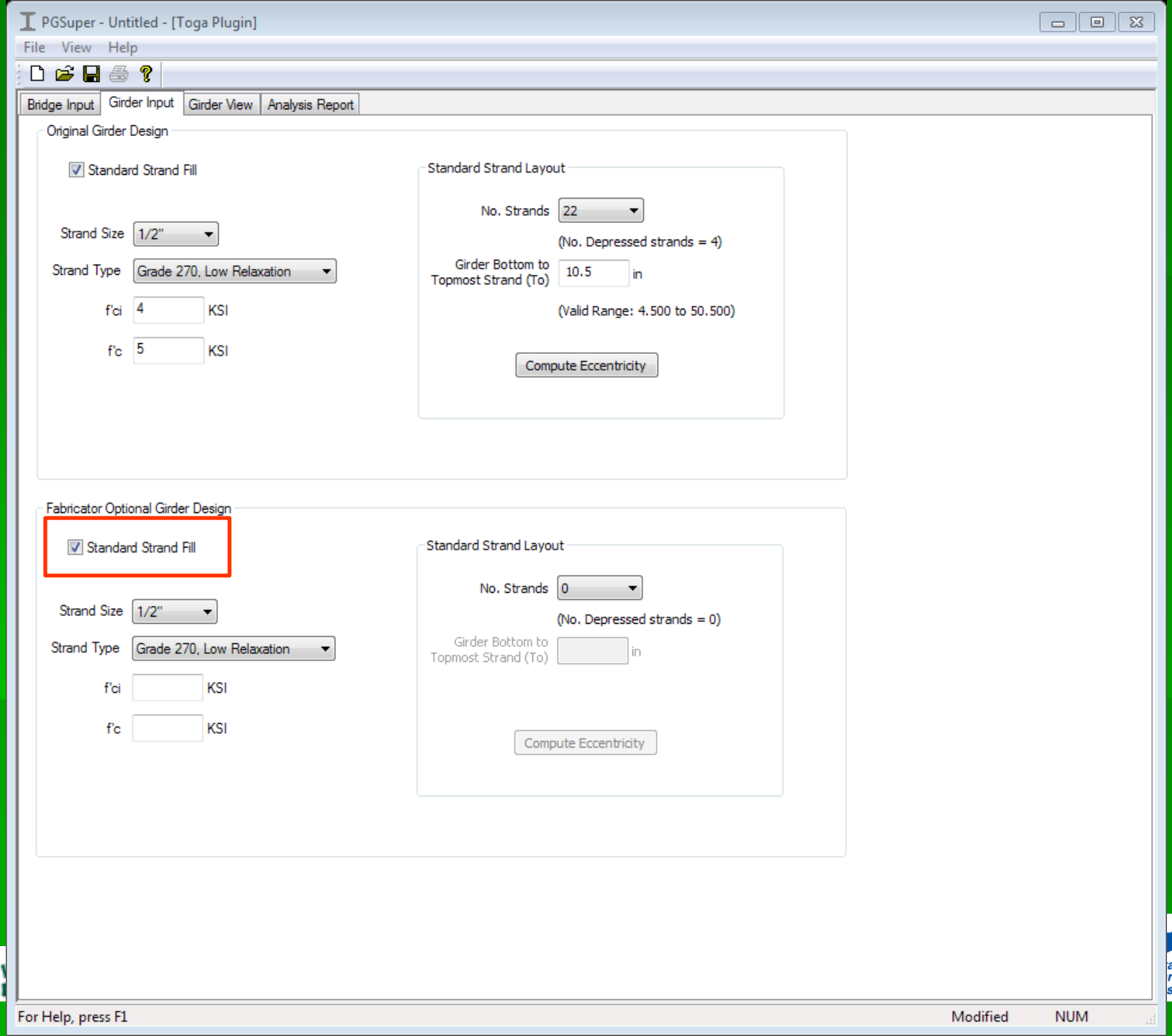
Bridge Input Girder Input Girder View Analysis Report
Original Girder Design
Standard Strand Fill
Strand Size 1/2"
Strand Type Grade 270, Low Relaxation
f'ci 4 KSI
f'c 5 KSI
Standard Strand Layout
No. Strands 22
(No. Depressed strands = 4)
Girder Bottom to Topmost Strand (To) 10.5 in
(Valid Range: 4.500 to 50.500)
Compute Eccentricity
Prestress Eccentricity
e, CL = 20.281 in
e, girder ends = 19.190 in
OK
Fabricator Optional Girder Design
Standard Strand Fill
Strand Size 1/2"
Strand Type Grade 270, Low Relaxation
f'ci KSI
f'c KSI
(No. Depressed strands = 0)
Girder Bottom to Topmost Strand (To) in
Compute Eccentricity
For Help, press F1
Modified
NUM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Standard Strand Fill
Strand Size 1/2"
Strand Type Grade 270, Low Relaxation
f'ci 4 KSI
f'c 5 KSI
Standard Strand Layout
No. Strands 22
(No. Depressed strands = 4)
Girder Bottom to Topmost Strand (To) 10.5 in
(Valid Range: 4.500 to 50.500)
Compute Eccentricity
Fabricator Optional Girder Design
Standard Strand Fill
Strand Size 1/2"
Strand Type Grade 270, Low Relaxation
f'ci KSI
f'c KSI
Standard Strand Layout
No. Strands 0
(No. Depressed strands = 0)
Girder Bottom to Topmost Strand (To) in
Compute Eccentricity
For Help, press F1
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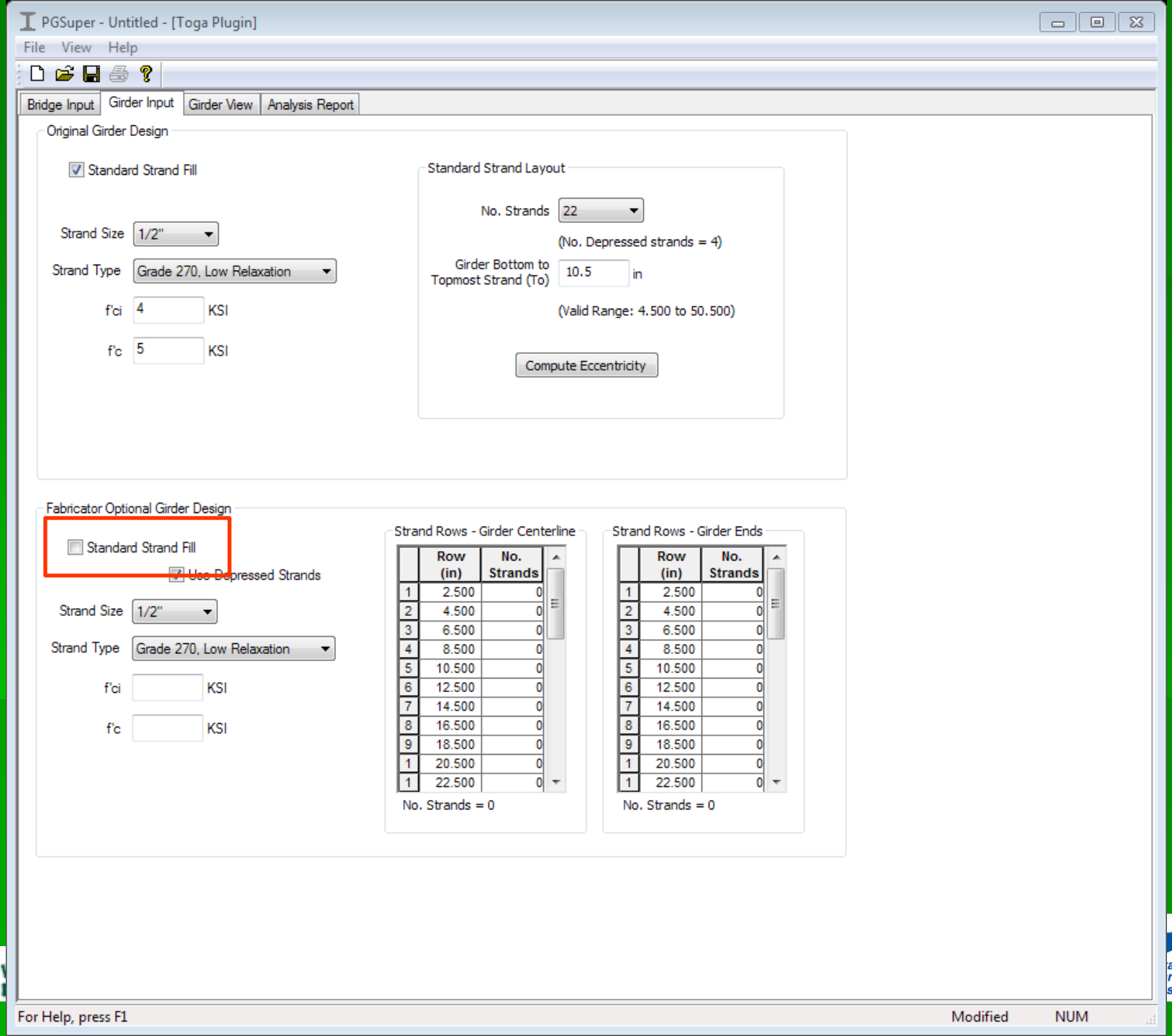
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Original Girder Design
Standard Strand Fill
Strand Size 1/2"
Strand Type Grade 270, Low Relaxation
f'ci 4 KSI
f'c 5 KSI
Standard Strand Layout
No. Strands 22
(No. Depressed strands = 4)
Girder Bottom to Topmost Strand (To) 10.5 in
(Valid Range: 4.500 to 50.500)
Compute Eccentricity
Fabricator Optional Girder Design
Standard Strand Fill
Use Depressed Strands
Strand Size 1/2"
Strand Type Grade 270, Low Relaxation
f'ci KSI
f'c KSI
Strand Rows - Girder Centerline
Row (in) No. Strands
1 2.500 0
2 4.500 0
3 6.500 0
4 8.500 0
5 10.500 0
6 12.500 0
7 14.500 0
8 16.500 0
9 18.500 0
1 20.500 0
1 22.500 0
No. Strands = 0
Strand Rows - Girder Ends
Row (in) No. Strands
1 2.500 0
2 4.500 0
3 6.500 0
4 8.500 0
5 10.500 0
6 12.500 0
7 14.500 0
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No. Strands = 0
For Help, press F1
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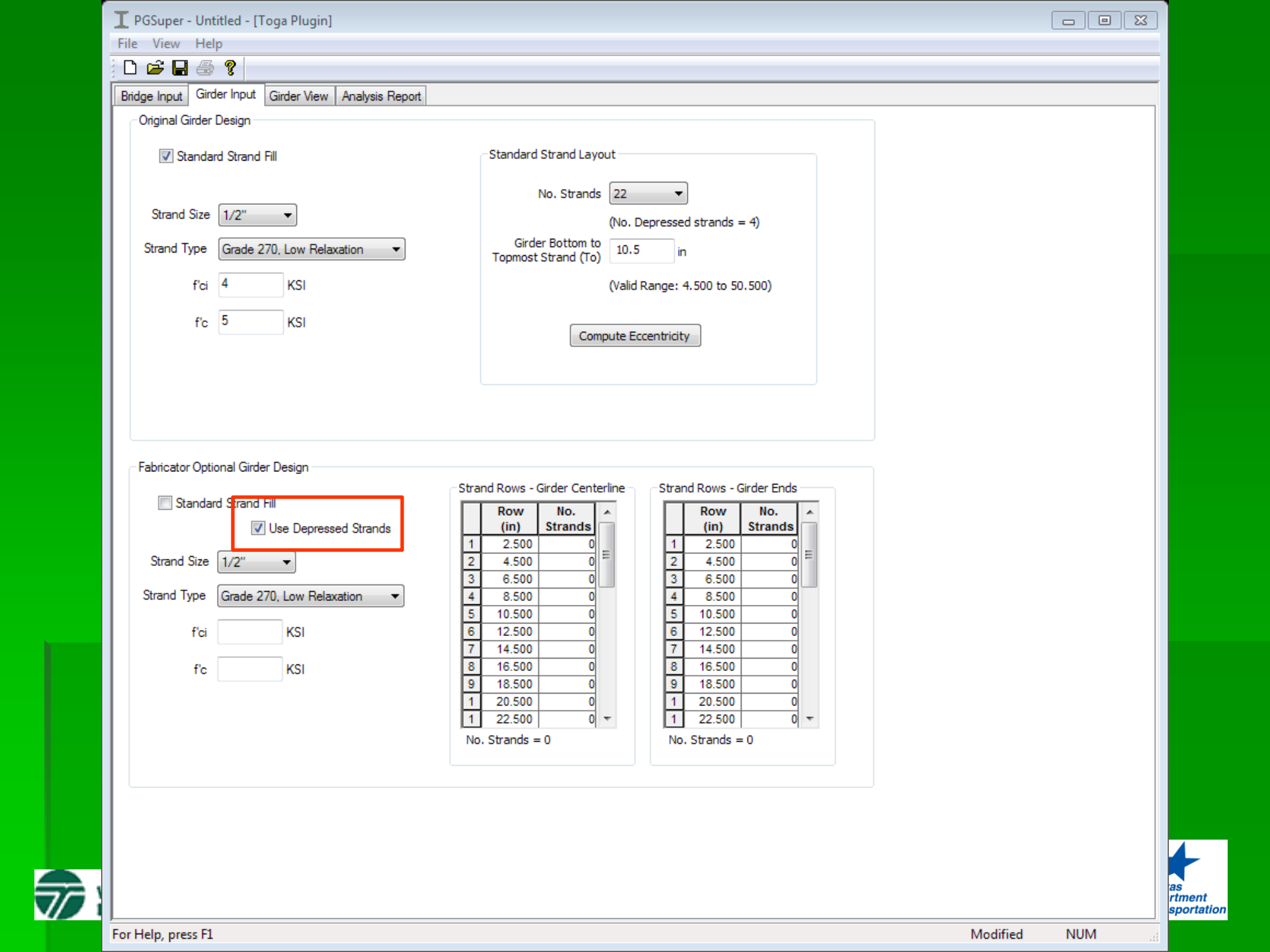
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Bridge Input Girder Input Girder View Analysis Report
Original Girder Design
Standard Strand Fill
Strand Size 1/2"
Strand Type Grade 270, Low Relaxation
f'ci 4 KSI
f'c 5 KSI
Standard Strand Layout
No. Strands 22
(No. Depressed strands = 4)
Girder Bottom to Topmost Strand (To) 10.5 in
(Valid Range: 4.500 to 50.500)
Compute Eccentricity
Fabricator Optional Girder Design
Standard Strand Fill
Use Depressed Strands
Strand Size 1/2"
Strand Type Grade 270, Low Relaxation
f'ci KSI
f'c KSI
Strand Rows - Girder Centerline
Row (in) No. Strands
1 2.500 0
2 4.500 0
3 6.500 0
4 8.500 0
5 10.500 0
6 12.500 0
7 14.500 0
8 16.500 0
9 18.500 0
1 20.500 0
1 22.500 0
No. Strands = 0
Strand Rows - Girder Ends
Row (in) No. Strands
1 2.500 0
2 4.500 0
3 6.500 0
4 8.500 0
5 10.500 0
6 12.500 0
7 14.500 0
8 16.500 0
9 18.500 0
1 20.500 0
1 22.500 0
No. Strands = 0
For Help, press F1
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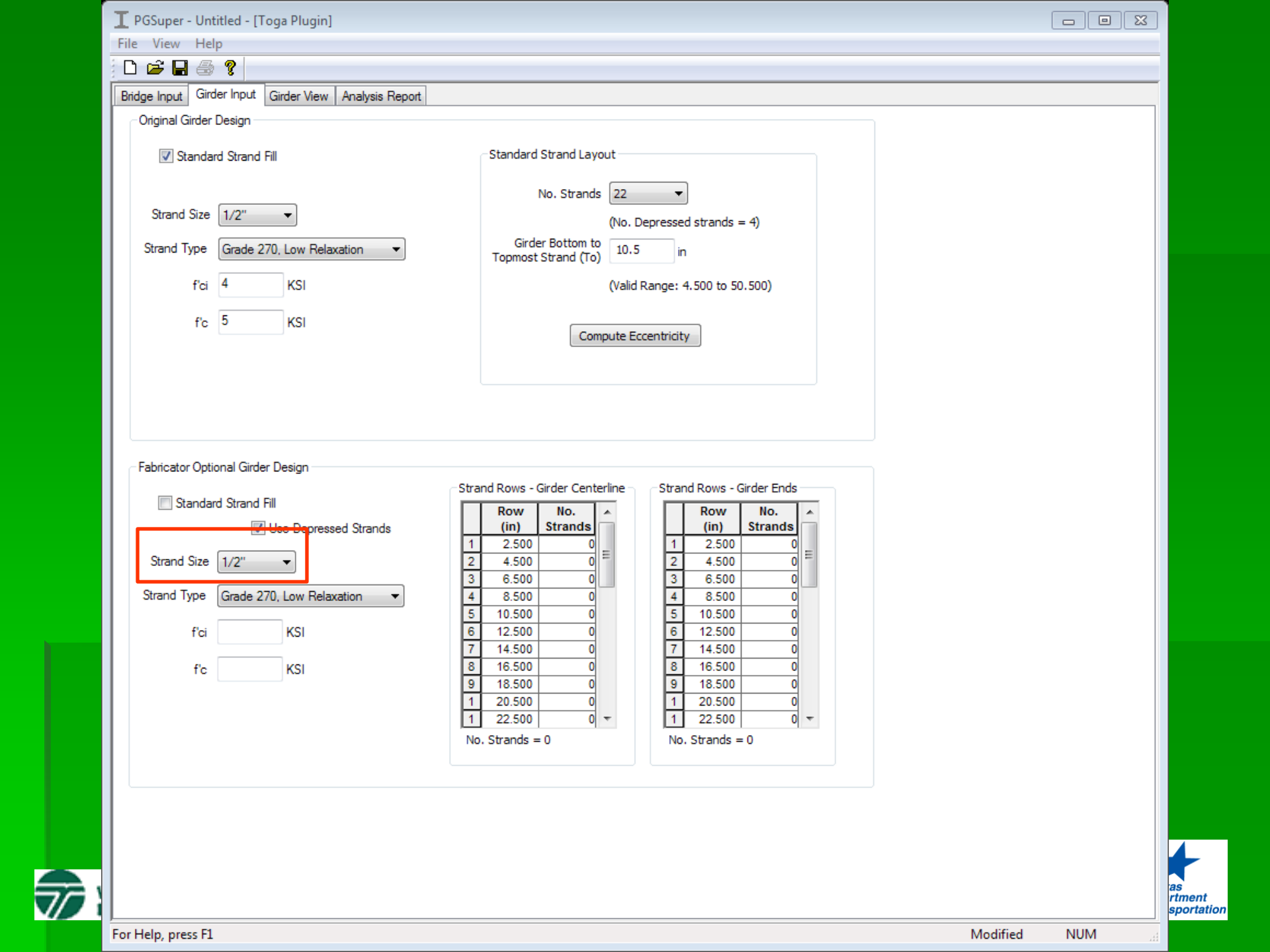
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Standard Strand Fill
Strand Size 1/2"
Strand Type Grade 270, Low Relaxation
f'ci 4 KSI
f'c 5 KSI
Standard Strand Layout
No. Strands 22
(No. Depressed strands = 4)
Girder Bottom to Topmost Strand (To) 10.5 in
(Valid Range: 4.500 to 50.500)
Compute Eccentricity
Fabricator Optional Girder Design
Standard Strand Fill
Use Depressed Strands
Strand Size 1/2"
Strand Type Grade 270, Low Relaxation
f'ci KSI
f'c KSI
Strand Rows - Girder Centerline
Row (in) No. Strands
1 2.500 0
2 4.500 0
3 6.500 0
4 8.500 0
5 10.500 0
6 12.500 0
7 14.500 0
8 16.500 0
9 18.500 0
1 20.500 0
1 22.500 0
No. Strands = 0
Strand Rows - Girder Ends
Row (in) No. Strands
1 2.500 0
2 4.500 0
3 6.500 0
4 8.500 0
5 10.500 0
6 12.500 0
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1 22.500 0
No. Strands = 0
For Help, press F1
Modified
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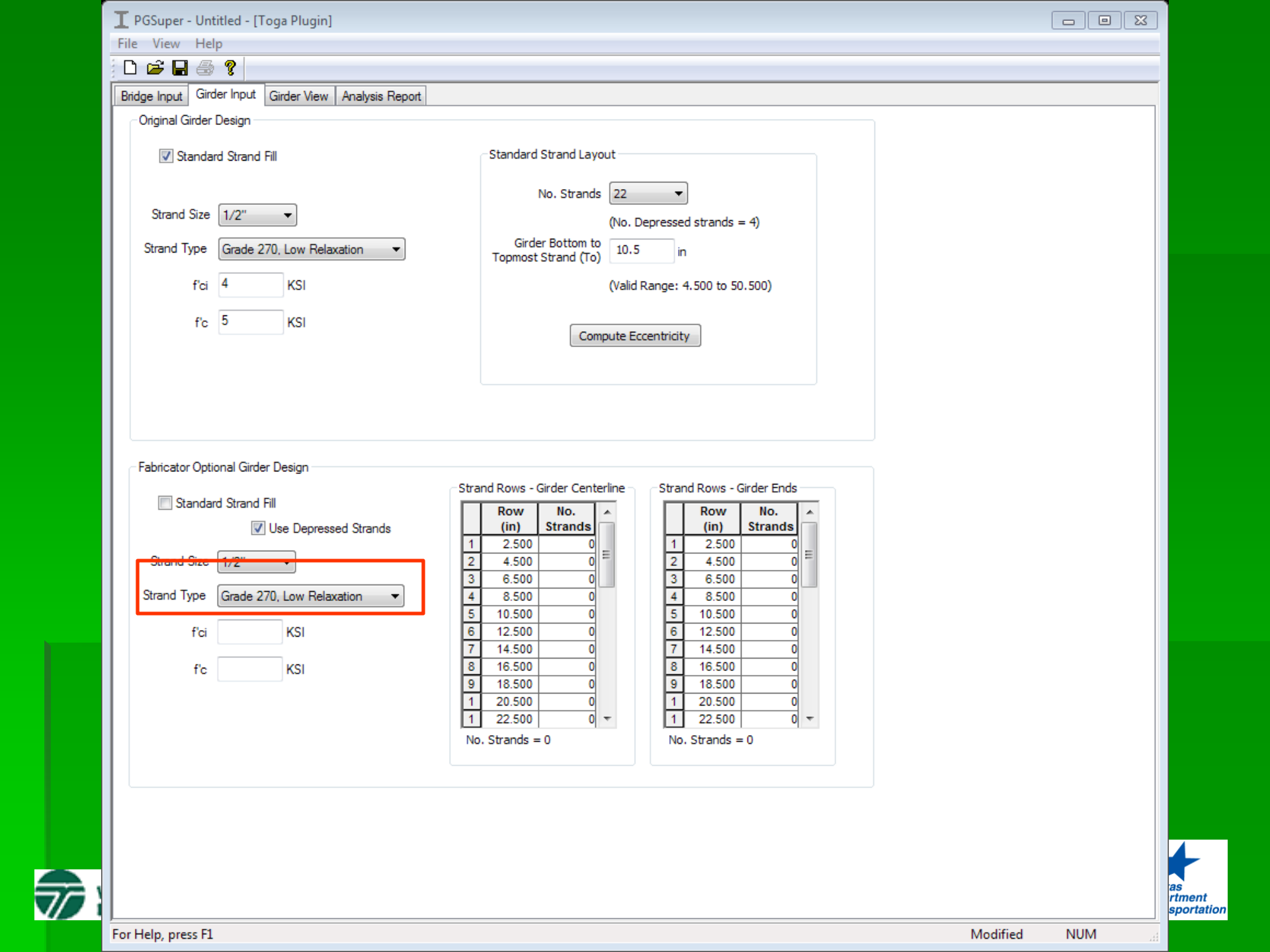
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(No. Depressed strands = 4)
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Compute Eccentricity
Fabricator Optional Girder Design
Standard Strand Fill
Use Depressed Strands
Strand Size 1/2"
Strand Type Grade 270, Low Relaxation
f'ci KSI
f'c KSI
Strand Rows - Girder Centerline
Row (in) No. Strands
1 2.500 0
2 4.500 0
3 6.500 0
4 8.500 0
5 10.500 0
6 12.500 0
7 14.500 0
8 16.500 0
9 18.500 0
1 20.500 0
1 22.500 0
No. Strands = 0
Strand Rows - Girder Ends
Row (in) No. Strands
1 2.500 0
2 4.500 0
3 6.500 0
4 8.500 0
5 10.500 0
6 12.500 0
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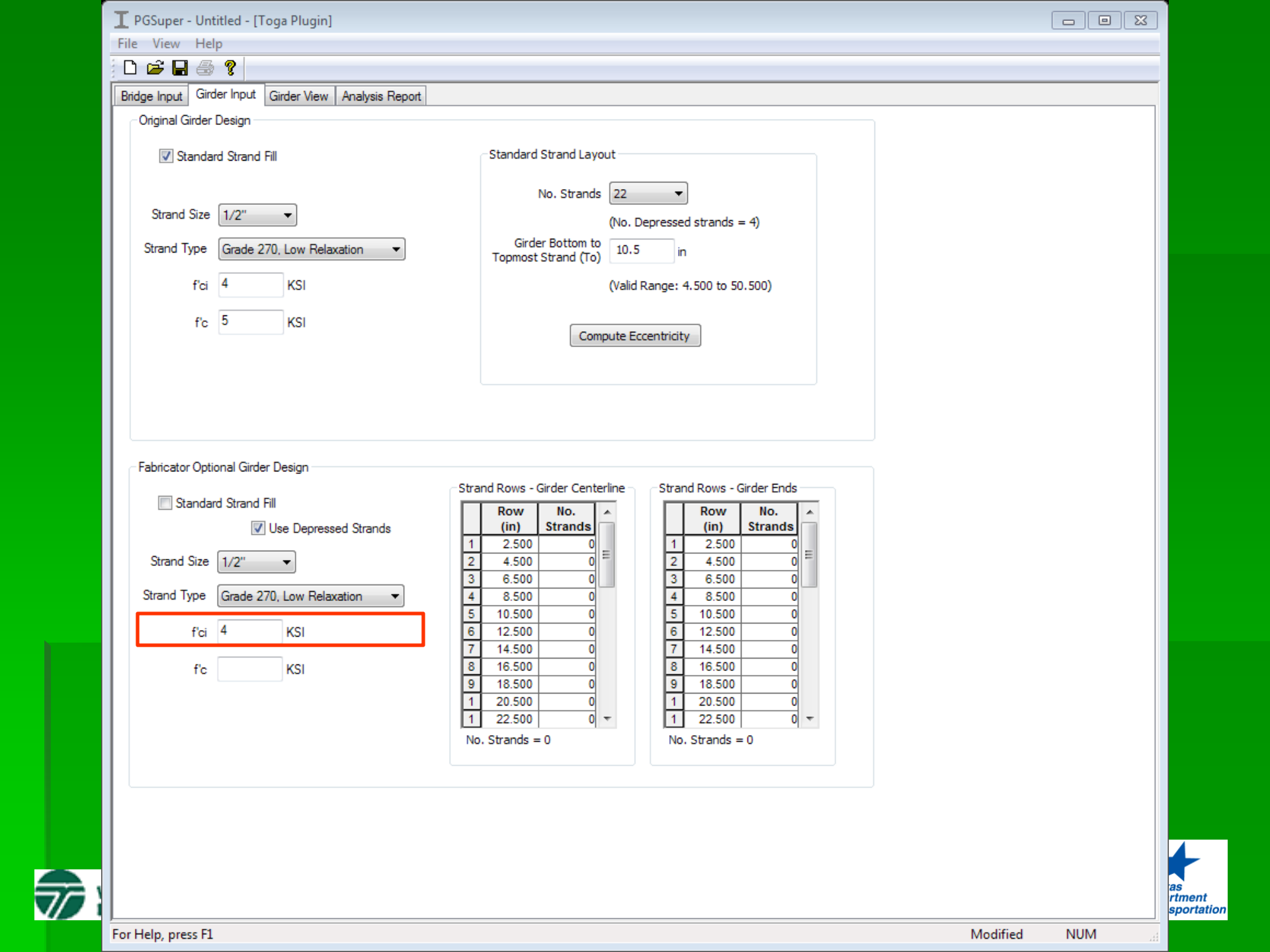
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Bridge Input Girder Input Girder View Analysis Report
Original Girder Design
Standard Strand Fill
Strand Size 1/2"
Strand Type Grade 270, Low Relaxation
f'ci 4 KSI
f'c 5 KSI
Standard Strand Layout
No. Strands 22
(No. Depressed strands = 4)
Girder Bottom to Topmost Strand (To) 10.5 in
(Valid Range: 4.500 to 50.500)
Compute Eccentricity
Fabricator Optional Girder Design
Standard Strand Fill
Use Depressed Strands
Strand Size 1/2"
Strand Type Grade 270, Low Relaxation
f'ci 4 KSI
f'c KSI
Strand Rows - Girder Centerline
Row (in) No. Strands
1 2.500 0
2 4.500 0
3 6.500 0
4 8.500 0
5 10.500 0
6 12.500 0
7 14.500 0
8 16.500 0
9 18.500 0
1 20.500 0
1 22.500 0
No. Strands = 0
Strand Rows - Girder Ends
Row (in) No. Strands
1 2.500 0
2 4.500 0
3 6.500 0
4 8.500 0
5 10.500 0
6 12.500 0
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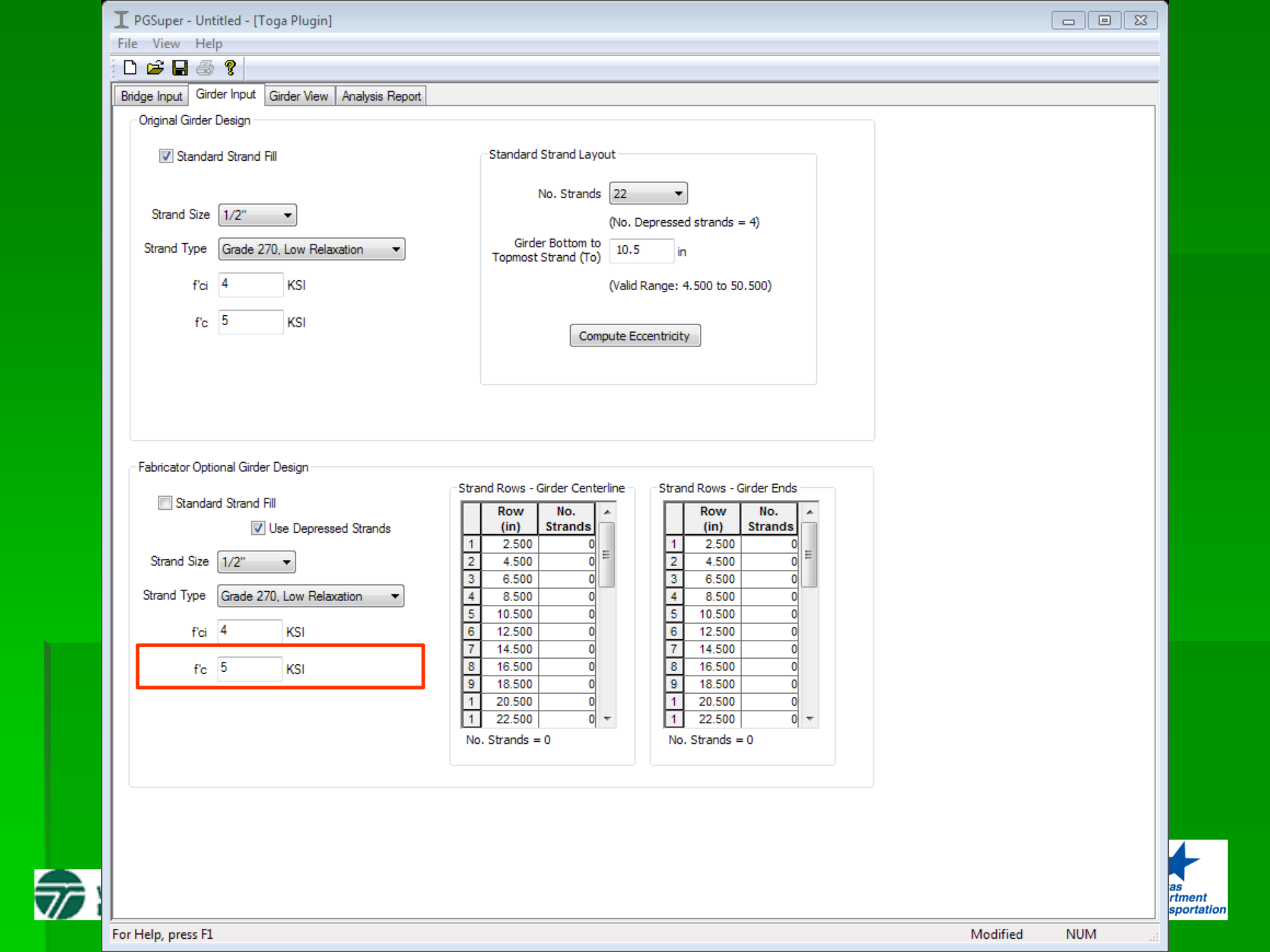
1 20.500 0
1 22.500 0
No. Strands = 0
For Help, press F1
Modified
NUM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Strand Size 1/2"
Strand Type Grade 270, Low Relaxation
f'ci 4 KSI
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Standard Strand Layout
No. Strands 22
(No. Depressed strands = 4)
Girder Bottom to Topmost Strand (To) 10.5 in
(Valid Range: 4.500 to 50.500)
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Fabricator Optional Girder Design
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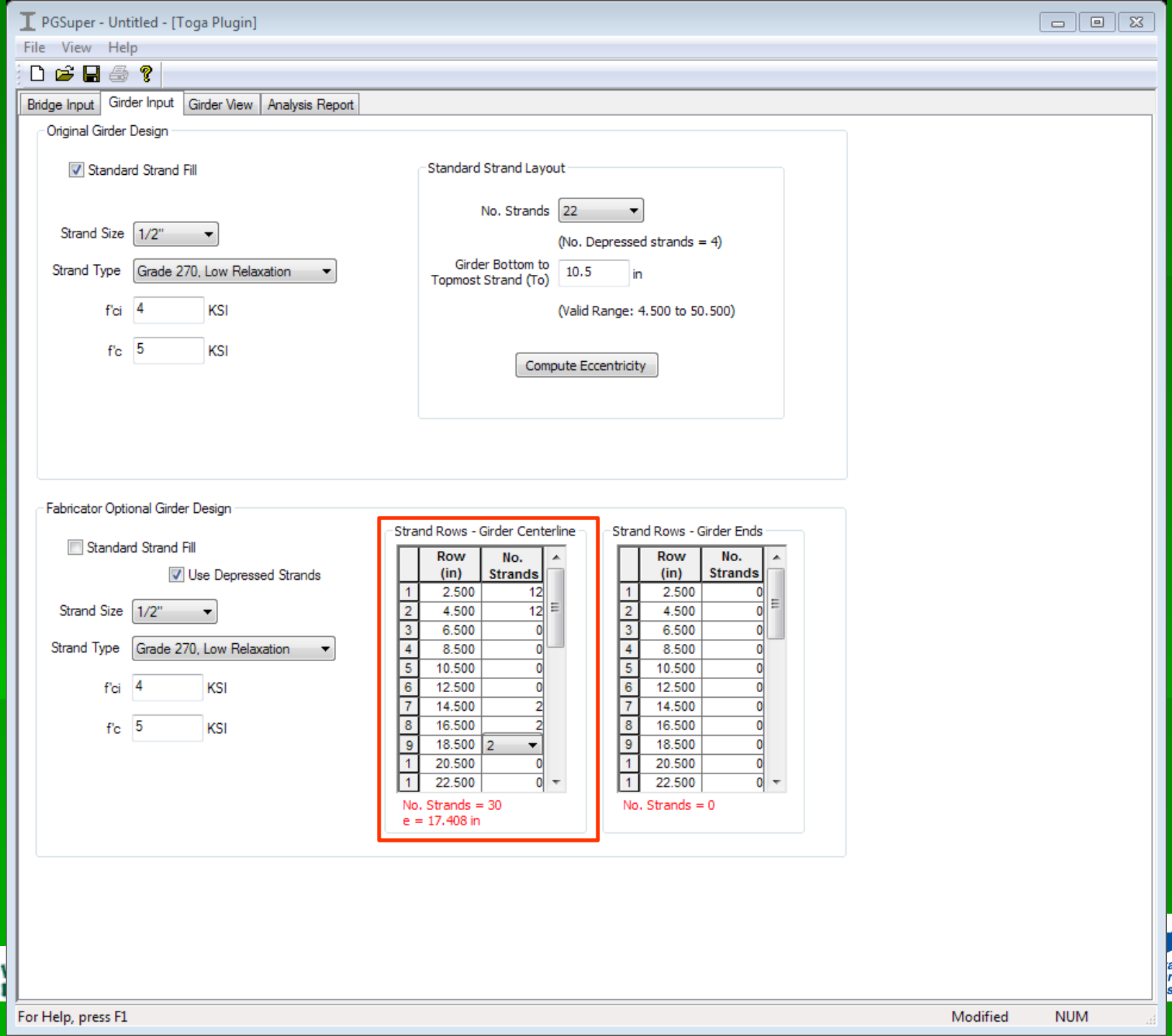
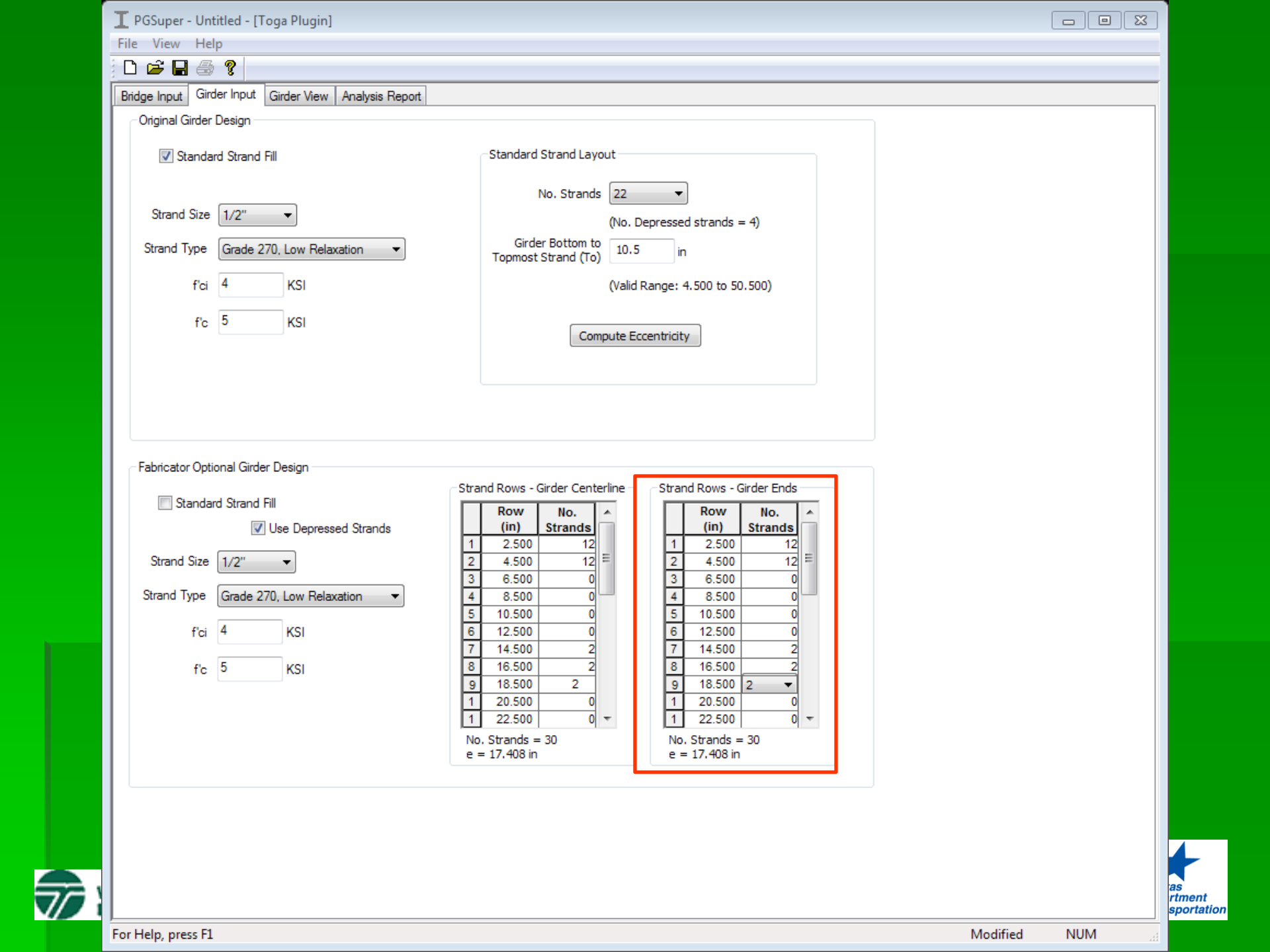
Strand Type Grade 270, Low Relaxation
f'ci 4 KSI
f'c 5 KSI
Strand Rows - Girder Centerline
Row (in) No. Strands
1 2.500 0
2 4.500 0
3 6.500 0
4 8.500 0
5 10.500 0
6 12.500 0
7 14.500 0
8 16.500 0
9 18.500 0
1 20.500 0
1 22.500 0
No. Strands = 0
Strand Rows - Girder Ends
Row (in) No. Strands
1 2.500 0
2 4.500 0
3 6.500 0
4 8.500 0
5 10.500 0
6 12.500 0
7 14.500 0
8 16.500 0
9 18.500 0
1 20.500 0
1 22.500 0
No. Strands = 0
For Help, press F1
Modified
NUM


PGSuper - Untitled - [Toga Plugin]
File View Help
Bridge Input Girder Input Girder View Analysis Report
Original Girder Design
Standard Strand Fill
Strand Size 1/2"
Strand Type Grade 270, Low Relaxation
f'ci 4 KSI
f'c 5 KSI
Standard Strand Layout
No. Strands 22
(No. Depressed strands = 4)
Girder Bottom to Topmost Strand (To) 10.5 in
(Valid Range: 4.500 to 50.500)
Compute Eccentricity
Fabricator Optional Girder Design
Standard Strand Fill
Use Depressed Strands
Strand Size 1/2"
Strand Type Grade 270, Low Relaxation
f'ci 4 KSI
f'c 5 KSI
Strand Rows - Girder Centerline
Row (in) No. Strands
1 2.500 12
2 4.500 12
3 6.500 0
4 8.500 0
5 10.500 0
6 12.500 0
7 14.500 2
8 16.500 2
9 18.500 2
1 20.500 0
1 22.500 0
No. Strands = 30
e = 17.408 in
Strand Rows - Girder Ends
Row (in) No. Strands
1 2.500 0
2 4.500 0
3 6.500 0
4 8.500 0
5 10.500 0
6 12.500 0
7 14.500 0
8 16.500 0
9 18.500 0
1 20.500 0
1 22.500 0
No. Strands = 0
For Help, press F1
Modified
NUM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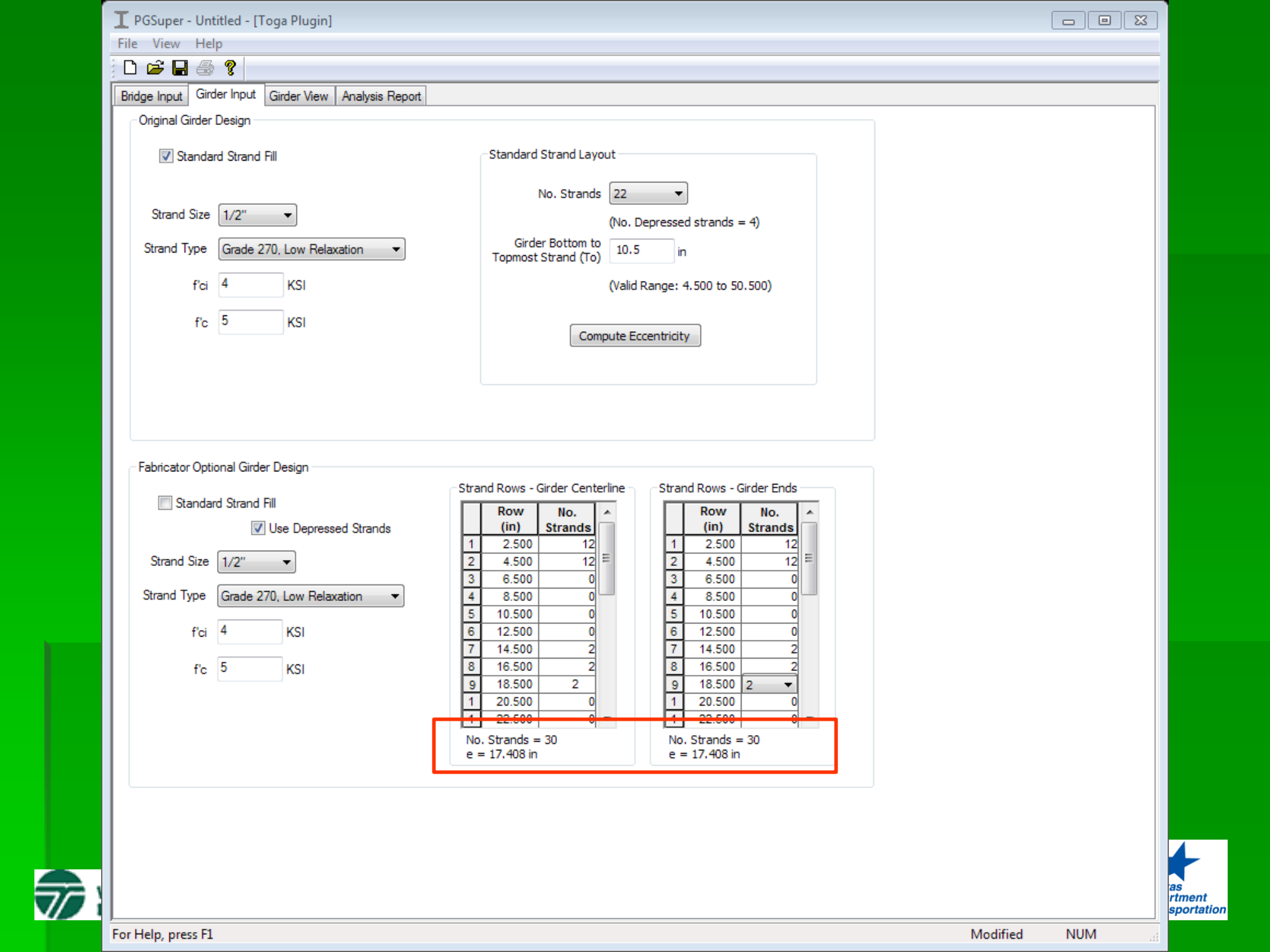
File View Help
Bridge Input Girder Input Girder View Analysis Report
Original Girder Design
Standard Strand Fill
Strand Size 1/2"
Strand Type Grade 270, Low Relaxation
f'ci 4 KSI
f'c 5 KSI
Standard Strand Layout
No. Strands 22
(No. Depressed strands = 4)
Girder Bottom to Topmost Strand (To) 10.5 in
(Valid Range: 4.500 to 50.500)
Compute Eccentricity
Fabricator Optional Girder Design
Standard Strand Fill
Use Depressed Strands
Strand Size 1/2"
Strand Type Grade 270, Low Relaxation
f'ci 4 KSI
f'c 5 KSI
Strand Rows - Girder Centerline
Row (in) No. Strands
1 2.500 12
2 4.500 12
3 6.500 0
4 8.500 0
5 10.500 0
6 12.500 0
7 14.500 2
8 16.500 2
9 18.500 2
1 20.500 0
1 22.500 0
No. Strands = 30
e = 17.408 in
Strand Rows - Girder Ends
Row (in) No. Strands
1 2.500 12
2 4.500 12
3 6.500 0
4 8.500 0
5 10.500 0
6 12.500 0
7 14.500 2
8 16.500 2
9 18.500 2
1 20.500 0
1 22.500 0
No. Strands = 30
e = 17.408 in
For Help, press F1
Modified
NUM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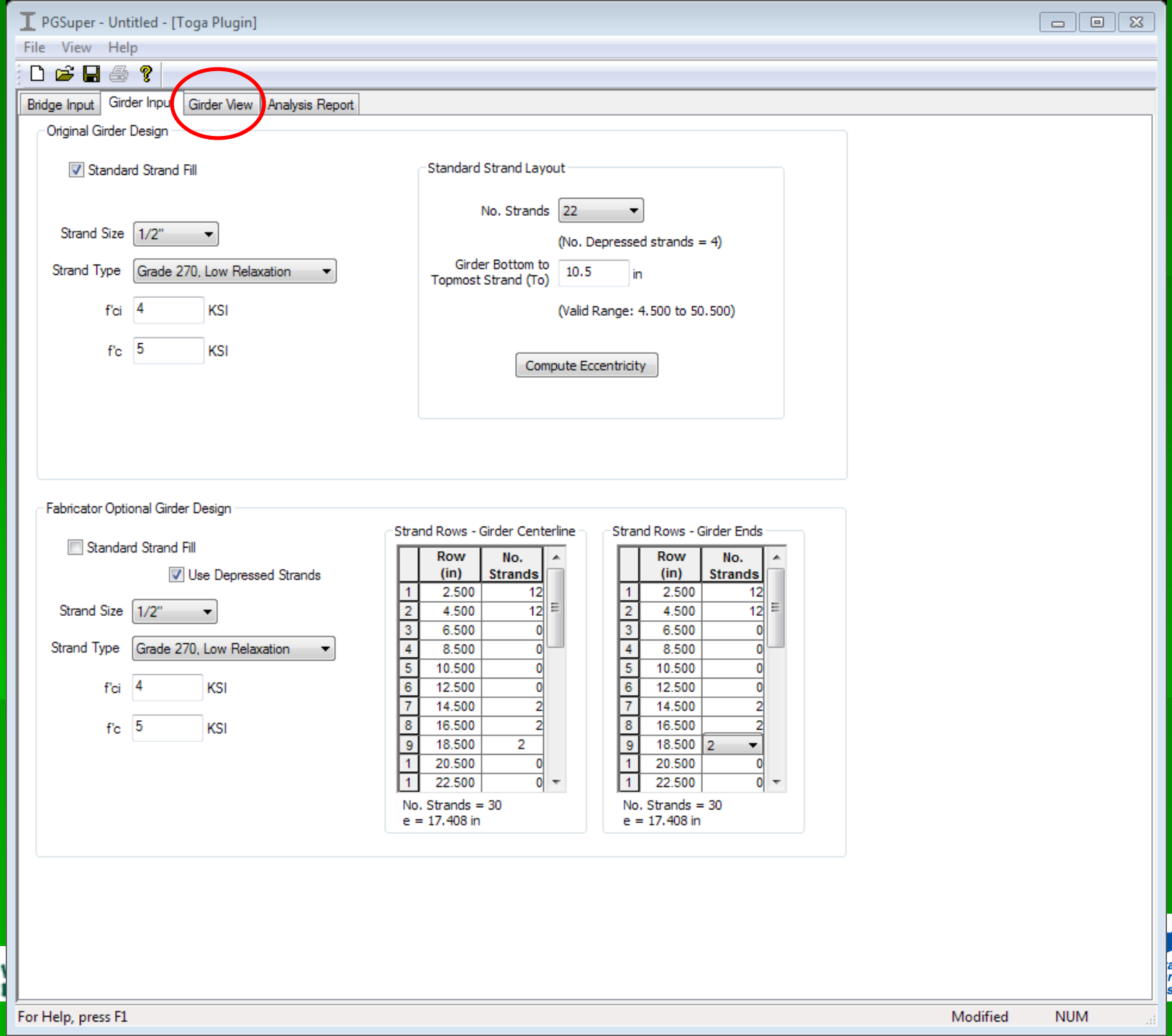
File View Help
Bridge Input Girder Input Girder View Analysis Report
Original Girder Design
Standard Strand Fill
Strand Size 1/2"
Strand Type Grade 270, Low Relaxation
f'ci 4 KSI
f'c 5 KSI
Standard Strand Layout
No. Strands 22
(No. Depressed strands = 4)
Girder Bottom to Topmost Strand (To) 10.5 in
(Valid Range: 4.500 to 50.500)
Compute Eccentricity
Fabricator Optional Girder Design
Standard Strand Fill
Use Depressed Strands
Strand Size 1/2"
Strand Type Grade 270, Low Relaxation
f'ci 4 KSI
f'c 5 KSI
Strand Rows - Girder Centerline
Row (in) No. Strands
1 2.500 12
2 4.500 12
3 6.500 0
4 8.500 0
5 10.500 0
6 12.500 0
7 14.500 2
8 16.500 2
9 18.500 2
1 20.500 0
No. Strands = 30
e = 17.408 in
Strand Rows - Girder Ends
Row (in) No. Strands
1 2.500 12
2 4.500 12
3 6.500 0
4 8.500 0
5 10.500 0
6 12.500 0
7 14.500 2
8 16.500 2
9 18.500 2
1 20.500 0
No. Strands = 30
e = 17.408 in
For Help, press F1
Modified
NUM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File View Help
Bridge Input
Girder Input
Girder View
Analysis Report
Original Girder Design
Standard Strand Fill
Strand Size 1/2"
Strand Type Grade 270, Low Relaxation
f'ci 4 KSI
f'c 5 KSI
Standard Strand Layout
No. Strands 22
(No. Depressed strands = 4)
Girder Bottom to Topmost Strand (To) 10.5 in
(Valid Range: 4.500 to 50.500)
Compute Eccentricity
Fabricator Optional Girder Design
Standard Strand Fill
Use Depressed Strands
Strand Size 1/2"
Strand Type Grade 270, Low Relaxation
f'ci 4 KSI
f'c 5 KSI
Strand Rows - Girder Centerline
Row (in) No. Strands
1 2.500 12
2 4.500 12
3 6.500 0
4 8.500 0
5 10.500 0
6 12.500 0
7 14.500 2
8 16.500 2
9 18.500 2
1 20.500 0
1 22.500 0
No. Strands = 30
e = 17.408 in
Strand Rows - Girder Ends
Row (in) No. Strands
1 2.500 12
2 4.500 12
3 6.500 0
4 8.500 0
5 10.500 0
6 12.500 0
7 14.500 2
8 16.500 2
9 18.500 2
1 20.500 0
1 22.500 0
No. Strands = 30
e = 17.408 in
For Help, press F1
Modified
NUM

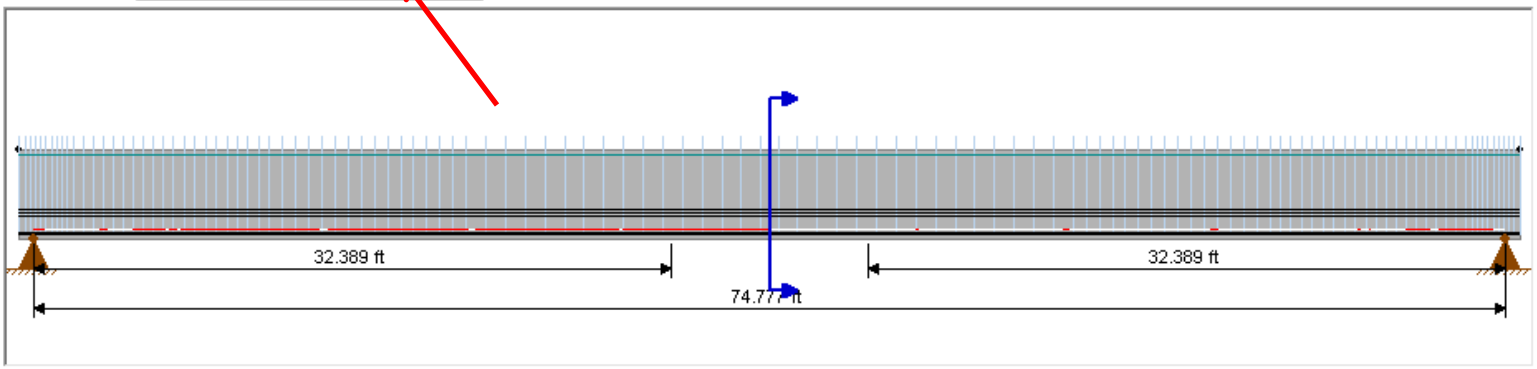
PGSuper - Untitled - [Toga Plugin]

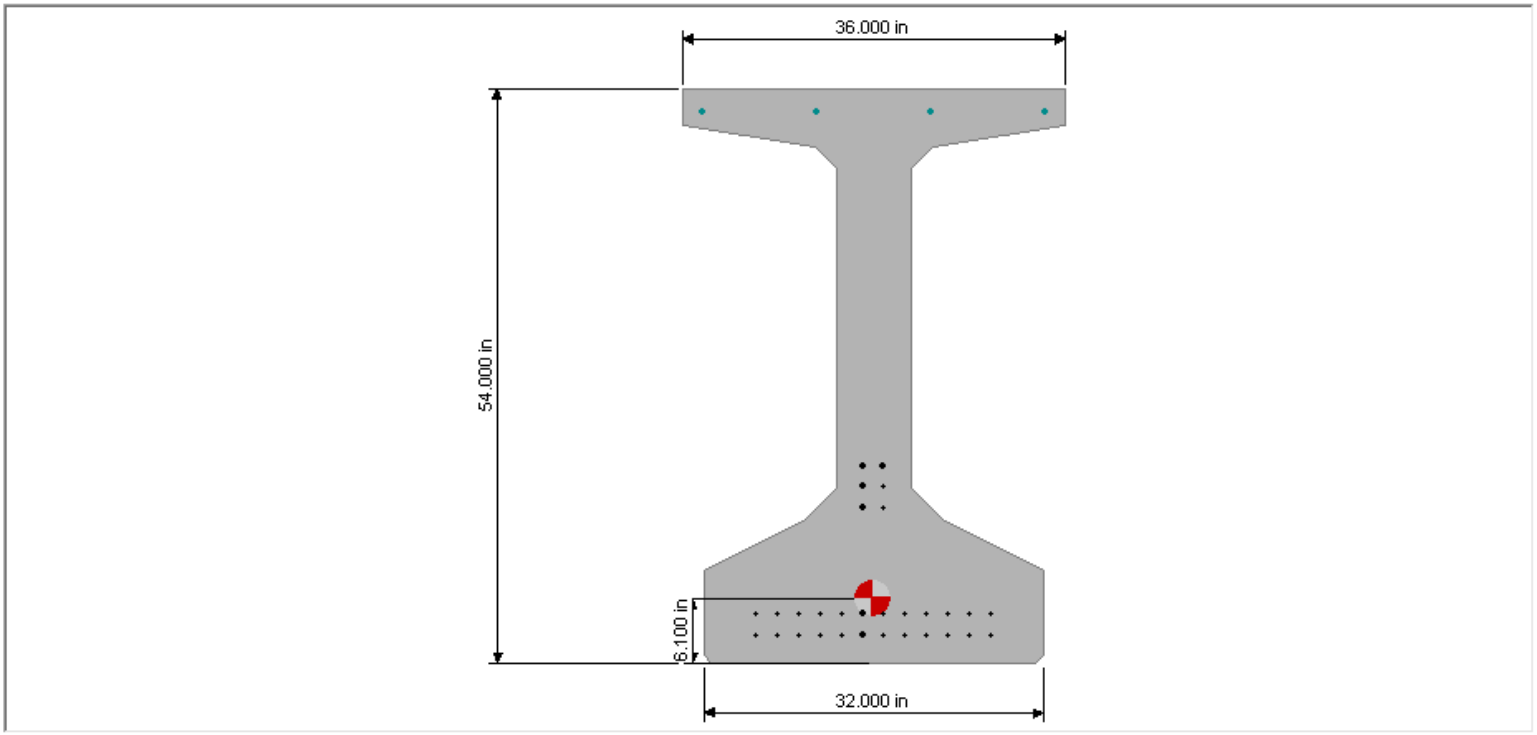
File View Help

Bridge Input | Girder Input | Girder View | Analysis Report

Select Girder: Fabricator Optional Design

Section Cut Offset: 38.139 ft





For Help, press F1 Modified NUM

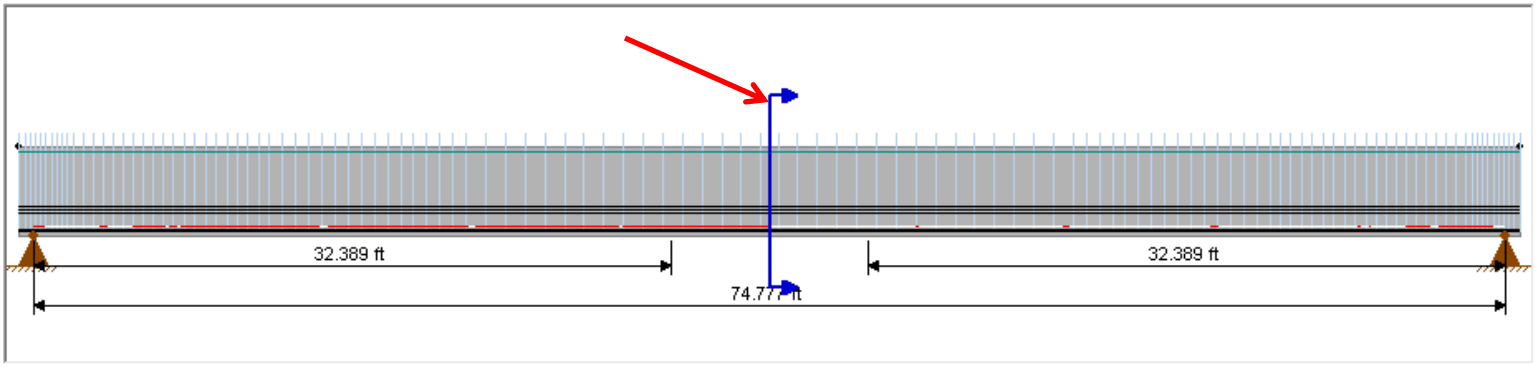
PGSuper - Untitled - [Toga Plugin]

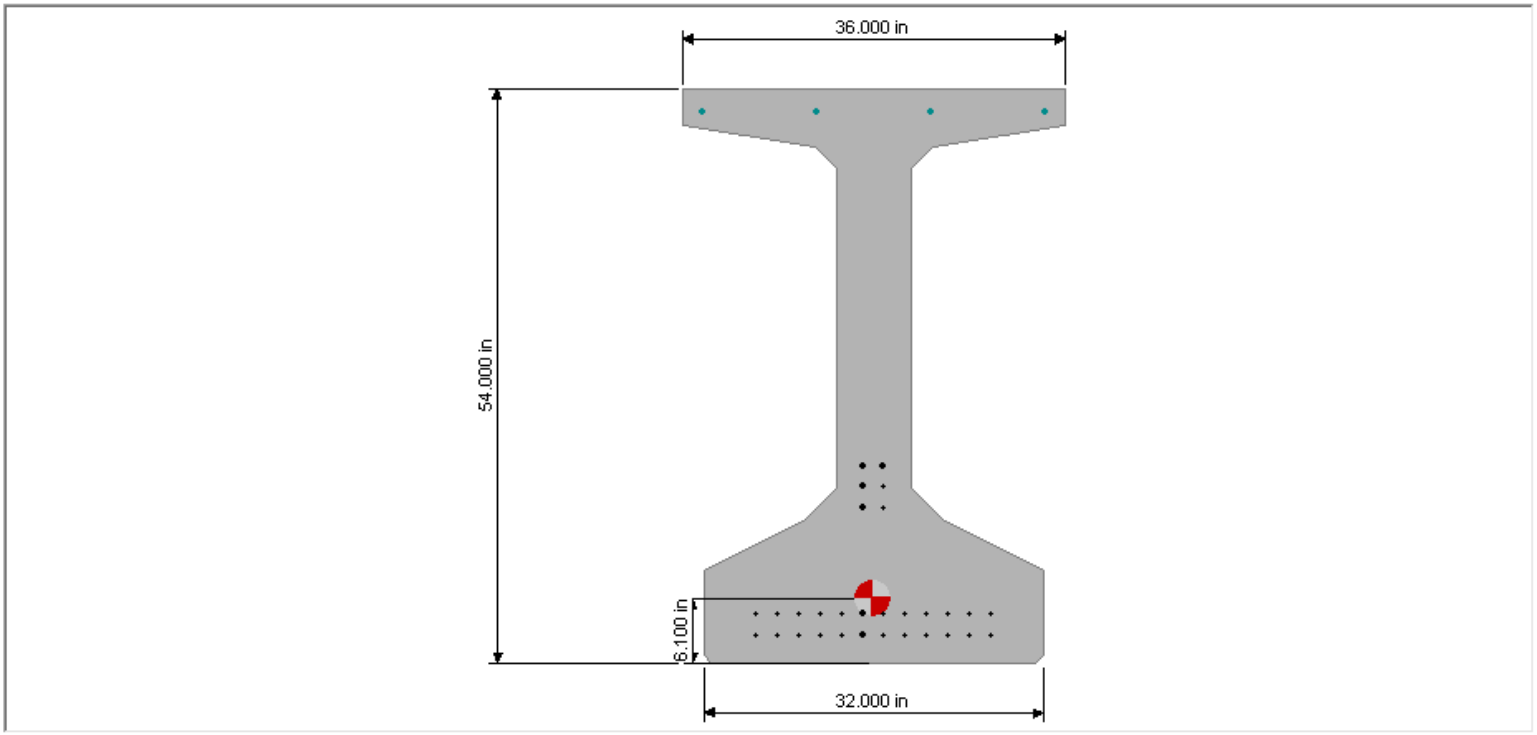
File View Help

Bridge Input | Girder Input | Girder View | Analysis Report

Select Girder: Fabricator Optional Design

Section Cut Offset: 38.139 ft





For Help, press F1 Modified NUM

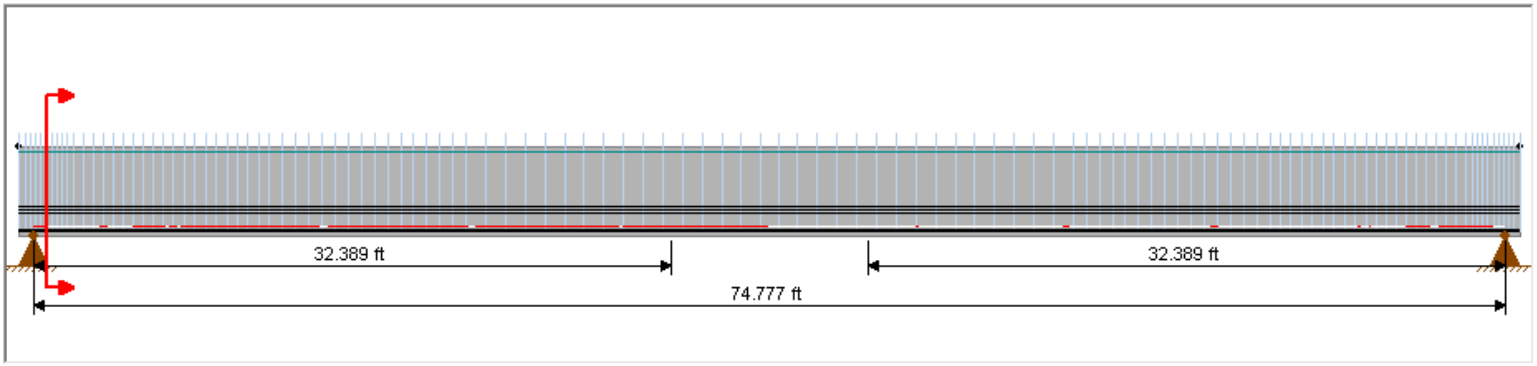
PGSuper - Untitled - [Toga Plugin]

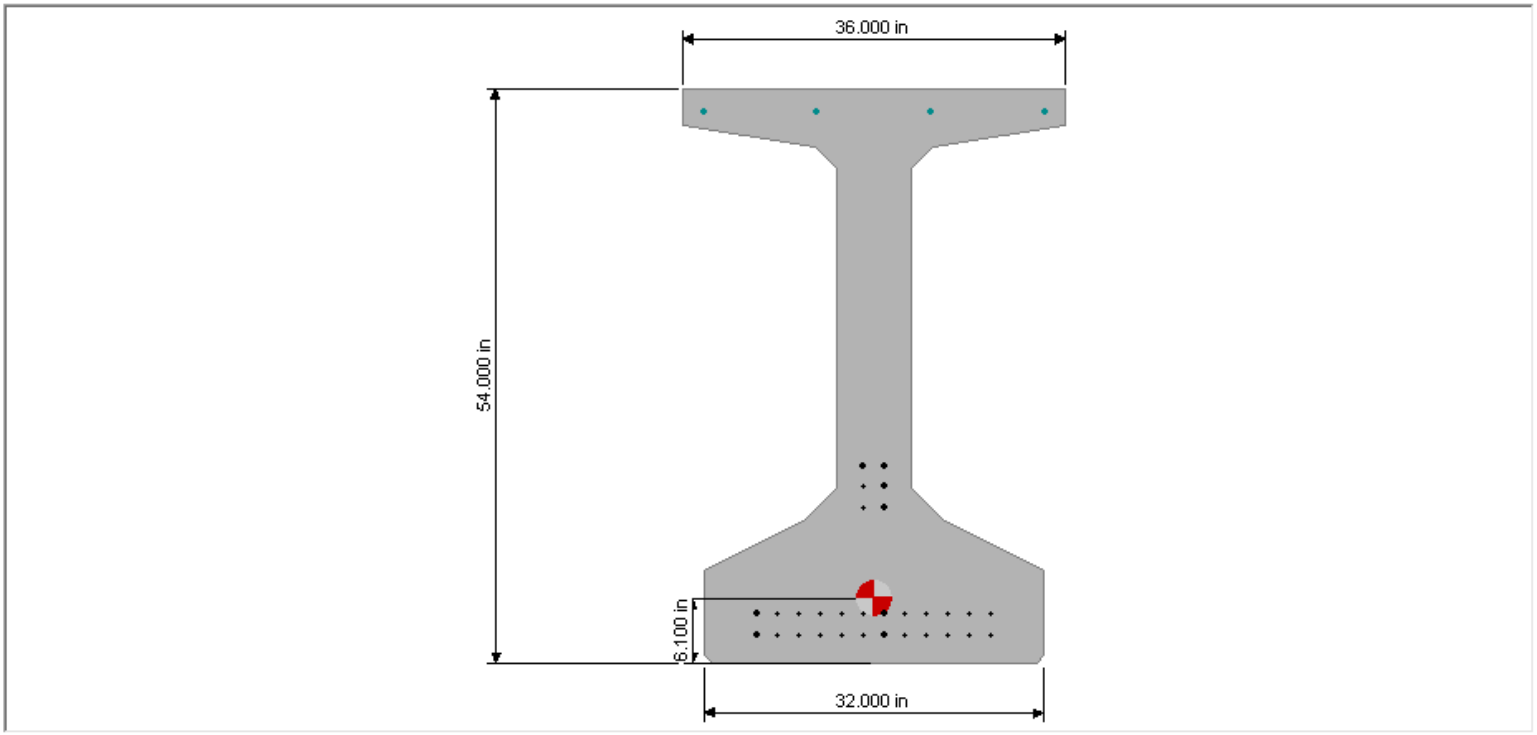
File View Help

Bridge Input | Girder Input | Girder View | Analysis Report

Select Girder: Fabricator Optional Design

Section Cut Offset: 1.356 ft





For Help, press F1 Modified NUM

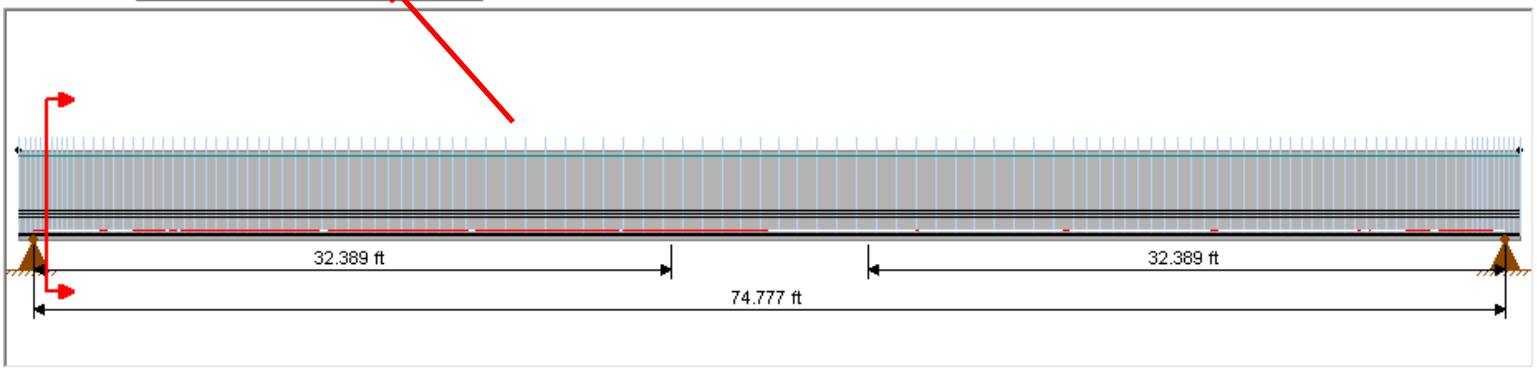
PGSuper - Untitled - [Toga Plugin]

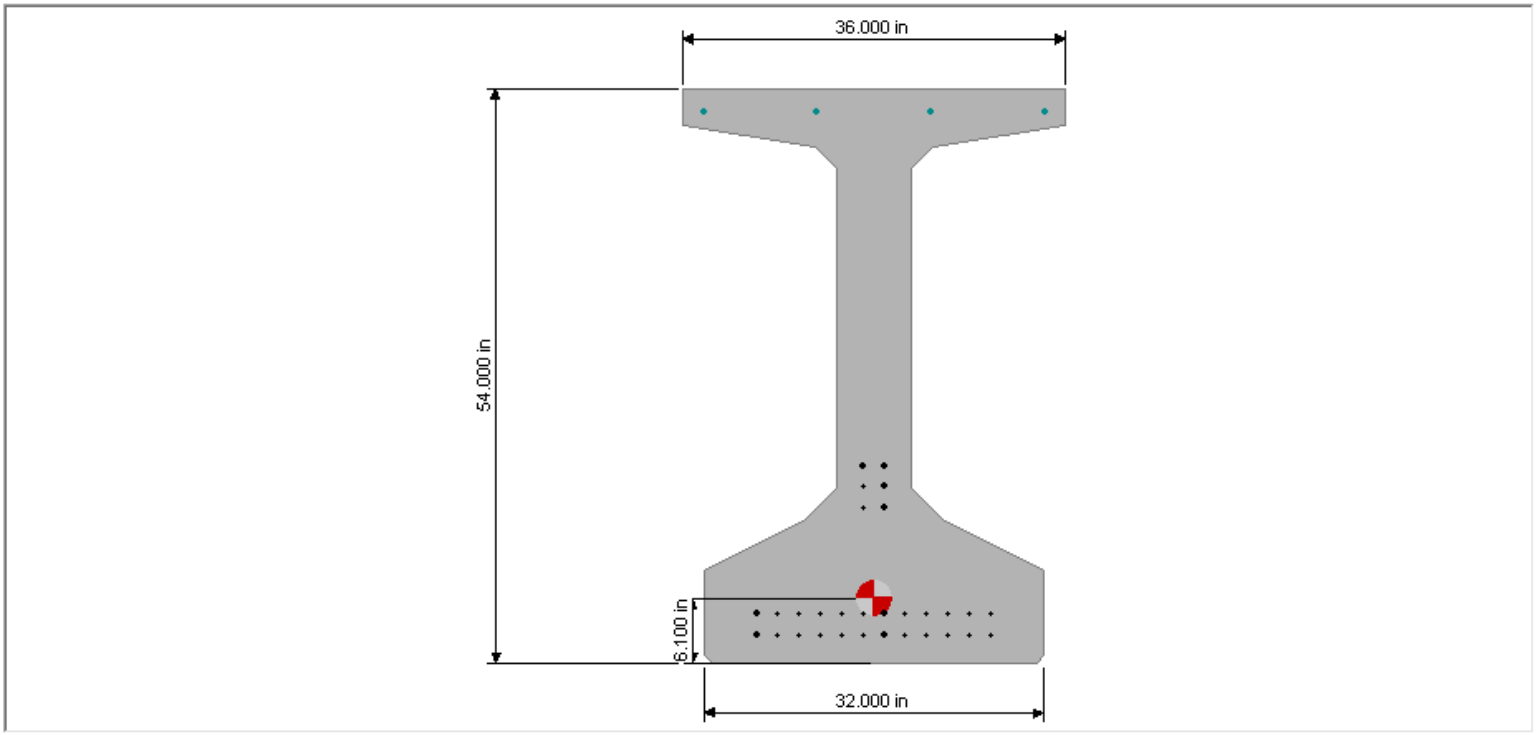
File View Help

Bridge Input | Girder Input | Girder View | Analysis Report

Select Girder: Fabricator Optional Design

Section Cut Offset: 1.356 ft





For Help, press F1 Modified NUM

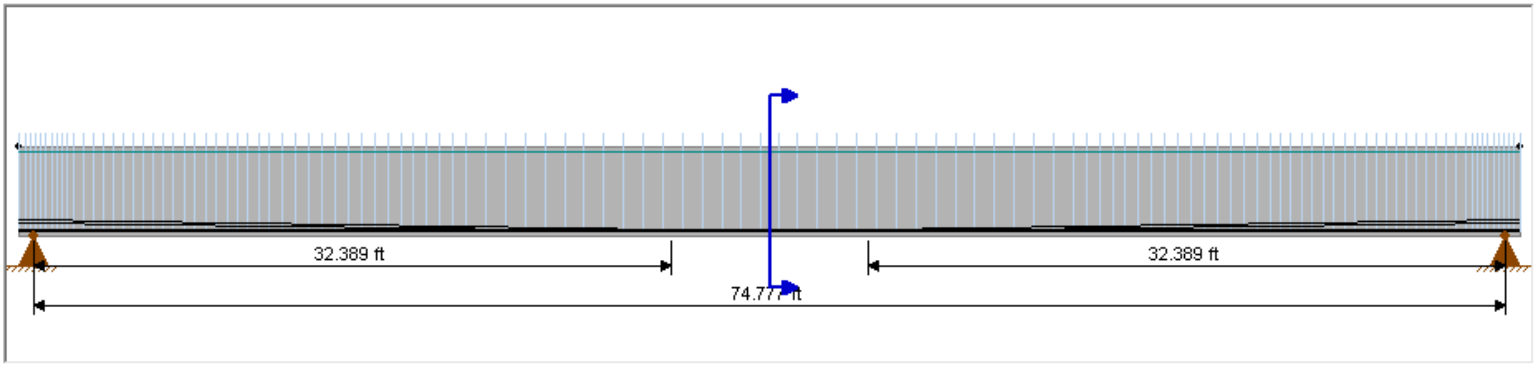
PGSuper - Untitled - [Toga Plugin]

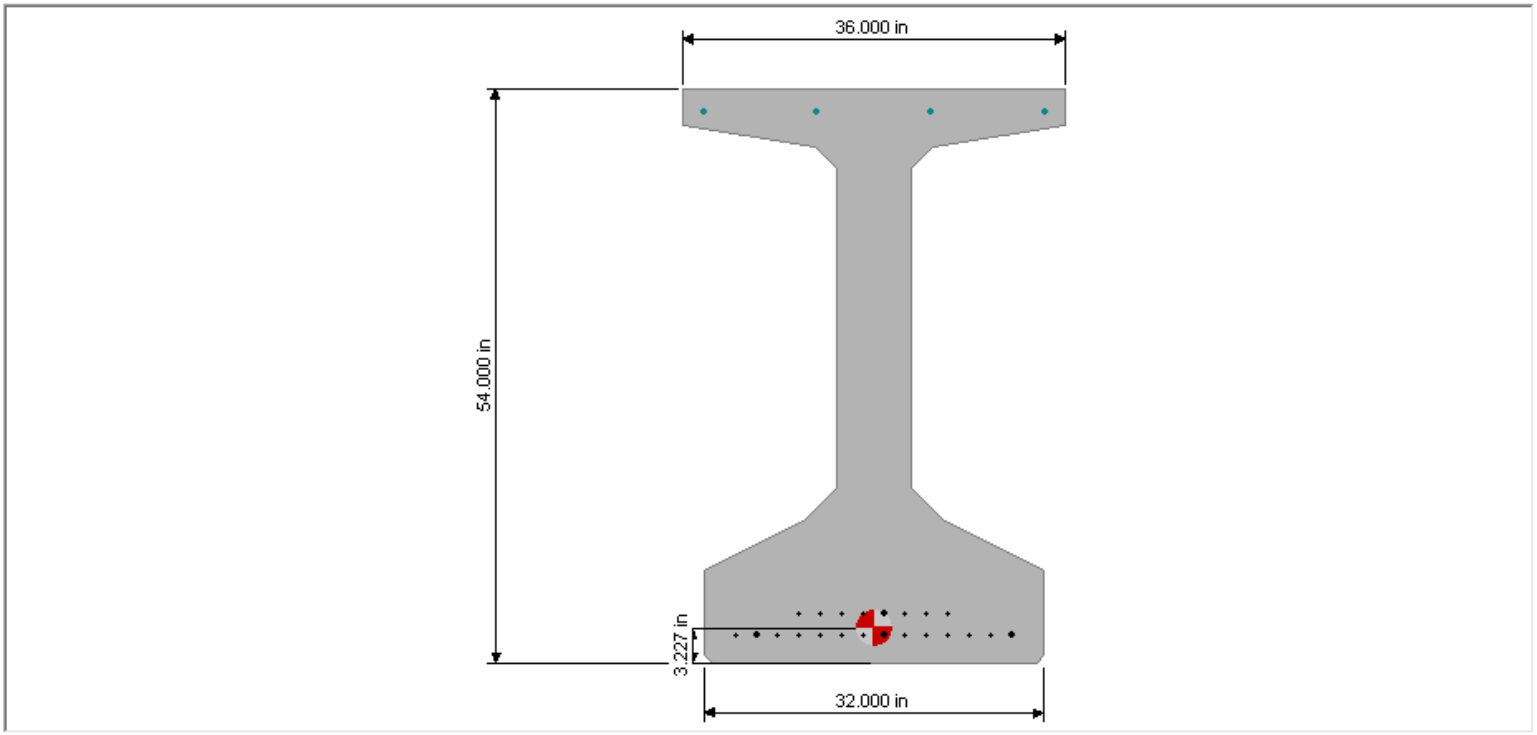
File View Help

Bridge Input | Girder Input | Girder View | Analysis Report

Select Girder: Original Design

Section Cut Offset: 38.139 ft





For Help, press F1 Modified NUM

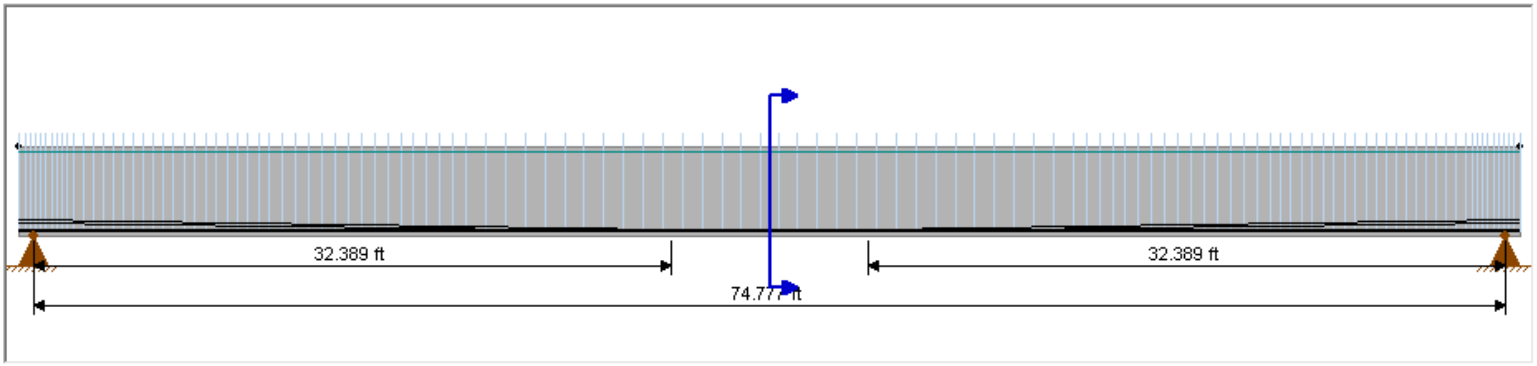
PGSuper - Untitled - [Toga Plugin]

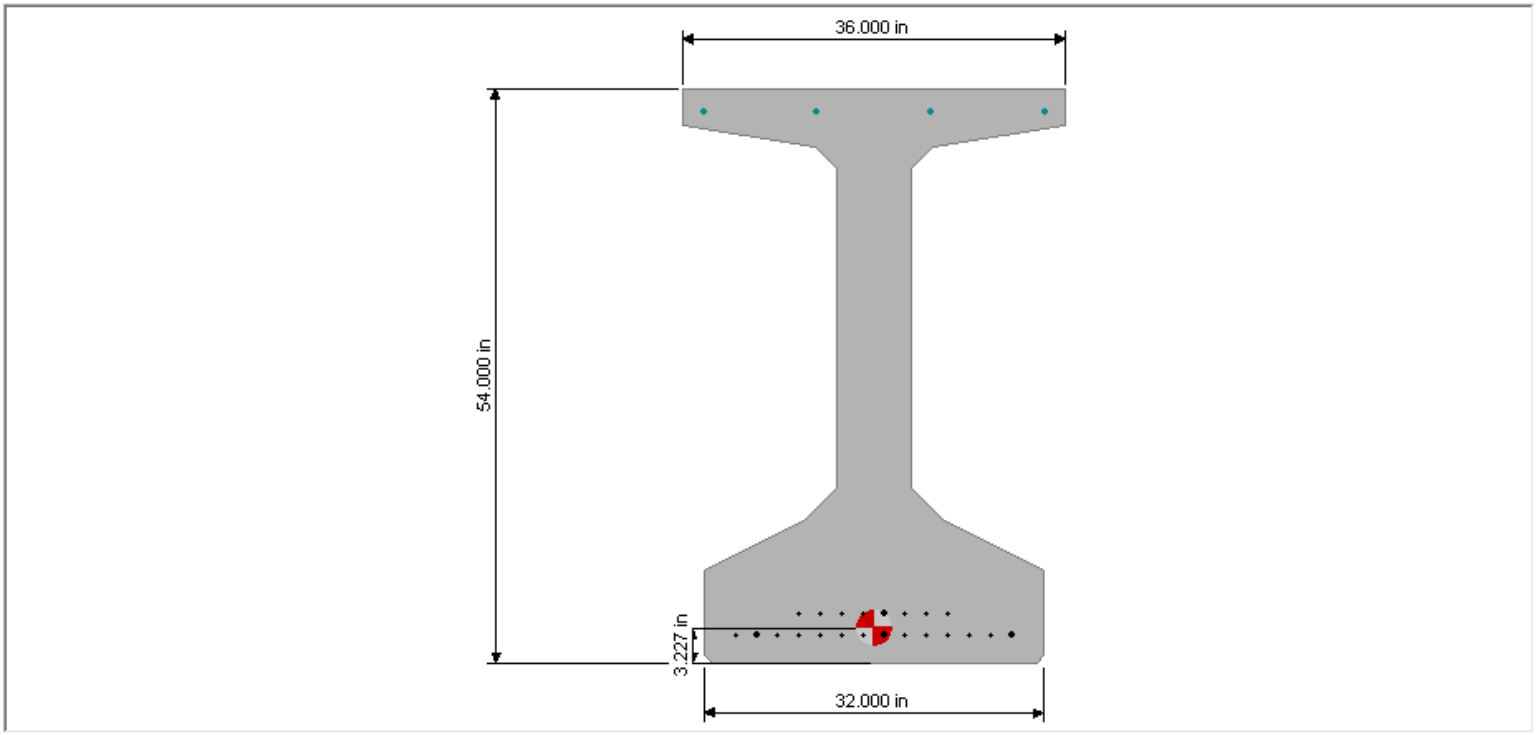
File View Help

Bridge Input | Girder Input | Girder View | Analysis Report

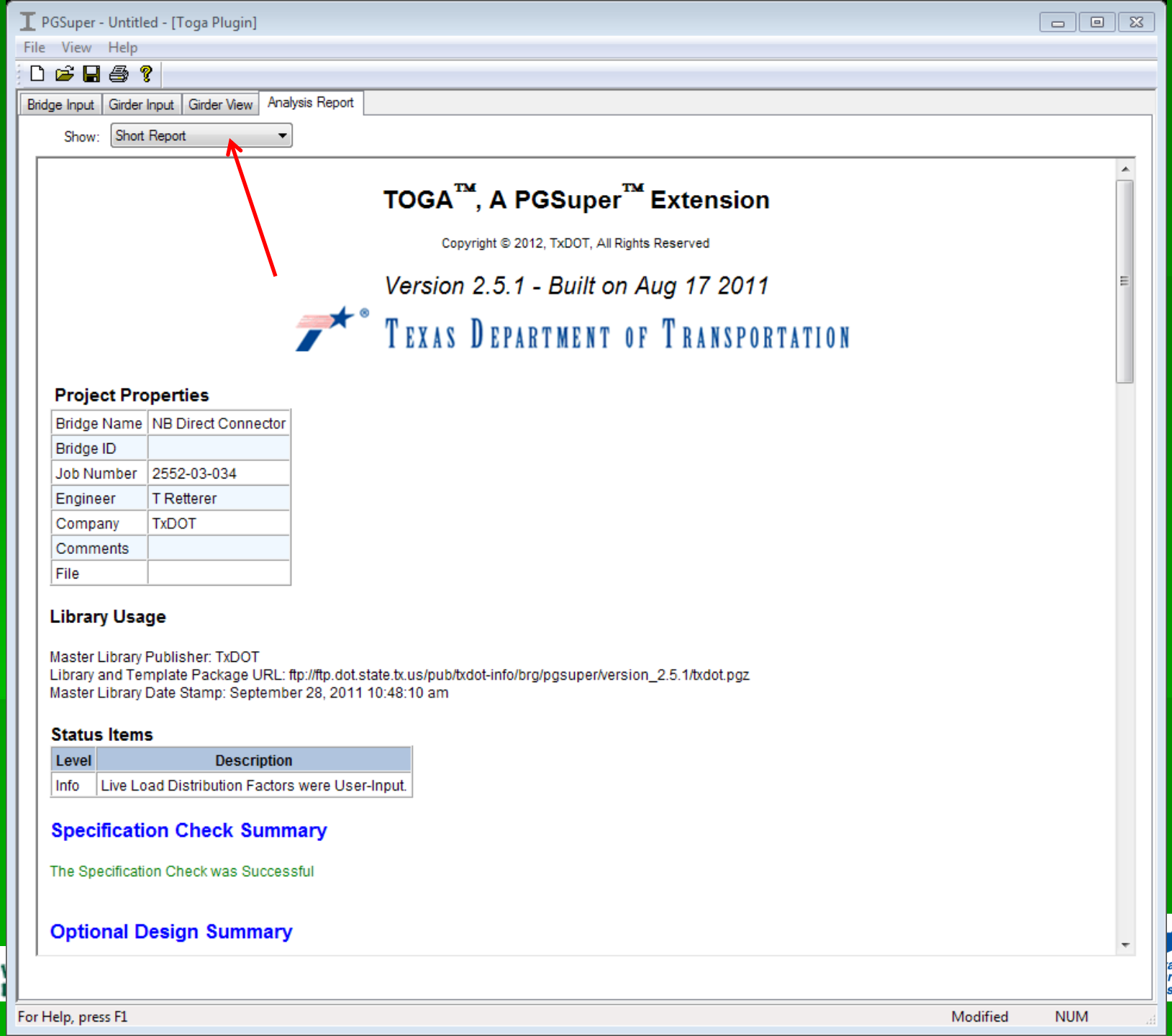
Select Girder: Original Design

Section Cut Offset: 38.139 ft





For Help, press F1 Modified NUM


PGSuper - Untitled - [Toga Plugin]
File View Help
Bridge Input
Girder Input
Girder View
Analysis Report
Show:
Short Report
TOGA™, A PGSuper™ Extension
Copyright © 2012, TxDOT, All Rights Reserved
Version 2.5.1 - Built on Aug 17 2011
Texas Department of Transportation
Project Properties
Bridge Name NB Direct Connector
Bridge ID
Job Number 2552-03-034
Engineer T Retterer
Company TxDOT
Comments
File
Library Usage
Master Library Publisher: TxDOT
Library and Template Package URL: ftp://ftp.dot.state.tx.us/pub/txdot-info/brg/pgsuper/version_2.5.1/txdot.pgz
Master Library Date Stamp: September 28, 2011 10:48:10 am
Status Items
Level Description
Info Live Load Distribution Factors were User-Input.
Specification Check Summary
The Specification Check was Successful
Optional Design Summary
For Help, press F1
Modified
NUM

PGSuper - Untitled - [Toga Plugin]

File View Help

Bridge Input | Girder Input | Girder View | Analysis Report

Show: Short Report

Optional Design Summary

Design Information

Span No.	7
Beam No.	1-4
Beam Type	Tx54
Span Length (CL Bearings)	74.777 ft
Beam Spacing	7.333 ft
Slab Thickness	8.500 in
Relative Humidity	60%
LLDF (Moment)	0.656
LLDF (Shear)	0.767
E_c Slab	5000 KSI
E_c Beam	5000 KSI
f'_c Slab	4.000 KSI
Project Criteria	TxDOT 2010
Live Load	HL-93

Design Data

f_t, Design Load Compressive Stress, Top CL	1.829 KSI
f_b, Design Load Tensile Stress, Bottom CL	-1.948 KSI
M_u, Required Ultimate Moment Capacity	4110.00 kip-ft
$W_{non\text{-}comp\ DC}$	0.000 kip/ft
$W_{comp\ DC}$	0.000 kip/ft
$W_{Overlay}$	0.000 kip/ft
Allowable Compressive Stress Factor at Release	$0.65f'_{ci}$

Note: Values in the above table reflect the following sign convention: Compressive stress is positive. Tensile stress is negative.

For Help, press F1 Modified

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File View Help

Bridge Input | Girder Input | Girder View | Analysis Report

Show: Short Report

Note: Values in the above table reflect the following sign convention: Compressive stress is positive. Tensile stress is negative.

Original Girder Design

f'_{ci}	4.000 KSI
f'_{c}	5.000 KSI
Prestressing Strands	1/2", Grade 270, Low Relaxation
No. Strands	22 (standard fill used)
Girder Bottom to Topmost Strand (To)	10.500 in
e_{CL}	20.281 in
$e_{\text{girder ends}}$	19.190 in

Fabricator Optional Girder Design

f'_{ci}	4.000 KSI
f'_{c}	5.000 KSI
Prestressing Strands	1/2", Grade 270, Low Relaxation
No. Strands	30 (non-standard fill, with depressed strands)
e_{CL}	17.408 in
$e_{\text{girder ends}}$	17.408 in

Non-Standard Strand Pattern at Girder Centerline

Row (in)	2.500	4.500	14.500	16.500	18.500
No. Strands	12	12	2	2	2

Non-Standard Strand Pattern at Girder Ends

Row (in)	2.500	4.500	14.500	16.500	18.500
No. Strands	12	12	2	2	2

For Help, press F1 Modified NUM

PGSuper - Untitled - [Toga Plugin]

File View Help

Bridge Input | Girder Input | Girder View | Analysis Report

Show: Short Report

Non-Standard Strand Pattern at Girder Ends

Row (in)	2.500	4.500	14.500	16.500	18.500
No. Strands	12	12	2	2	2

Input Design Data Vs. Calculated Design Data

Value	Input Design Data	Calculated Design Data	Input/Calculated Ratio	Status
Design Load Compressive Stress, Top CL (KSI)	1.829	1.654	1.10571	Ok
Design Load Tensile Stress, Bottom CL (KSI)	-1.948	-1.680	1.15957	Ok
Required Ultimate Moment (kip-ft)	4110.00	3565.68	1.15266	Ok

Note: Values in the above table reflect the following sign convention: Compressive stress is positive. Tensile stress is negative.

Analysis of Fabricator Optional Design

Value	Input Design Data	Analysis of Fabricator Optional Design	Input/Analysis Ratio	Status
Required f'_{ci} (KSI)	4.000	4.000	1	Ok
Required f'_{c} (KSI)	5.000	5.000	1	Ok
Ultimate Moment Capacity (kip-ft)	4110.00	5638.51	0.728915	Ok

Camber Analysis

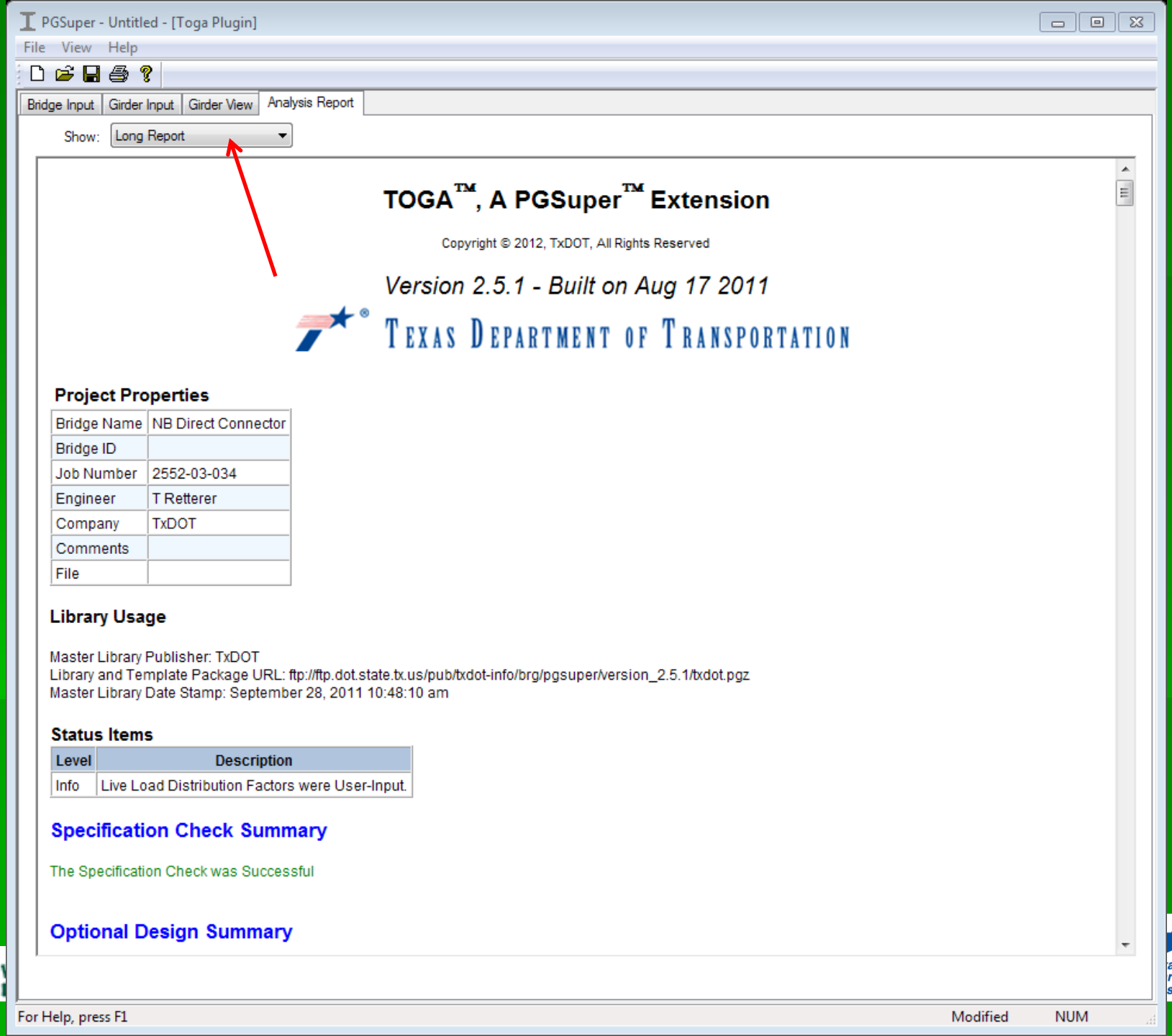
Value	Analysis of Original Design	Analysis of Fabricator Optional Design	Difference	Status
Maximum Camber (ft)	0.133	0.175	0.042	Design Deficiency

Note: Upward Camber is positive

Shear Design Check

Standard shear reinforcing pattern: Ok

For Help, press F1 Modified NUM


PGSuper - Untitled - [Toga Plugin]
File View Help
Bridge Input
Girder Input
Girder View
Analysis Report
Show:
Long Report
TOGA™, A PGSuper™ Extension
Copyright © 2012, TxDOT, All Rights Reserved
Version 2.5.1 - Built on Aug 17 2011
Texas Department of Transportation
Project Properties
Bridge Name NB Direct Connector
Bridge ID
Job Number 2552-03-034
Engineer T Retterer
Company TxDOT
Comments
File
Library Usage
Master Library Publisher: TxDOT
Library and Template Package URL: ftp://ftp.dot.state.tx.us/pub/txdot-info/brg/pgsuper/version_2.5.1/txdot.pgz
Master Library Date Stamp: September 28, 2011 10:48:10 am
Status Items
Level Description
Info Live Load Distribution Factors were User-Input.
Specification Check Summary
The Specification Check was Successful
Optional Design Summary
For Help, press F1
Modified
NUM

PGSuper - Untitled - [Toga Plugin]

File View Help

Bridge Input | Girder Input | Girder View | Analysis Report

Show: Long Report

	Original Design	Fabricator Optional Design		
Maximum Camber (ft)	0.133	0.175	0.042	Design Deficiency

Note: Upward Camber is positive

Shear Design Check

Standard shear reinforcing pattern: Ok

Beginning of Long Section of Report

Note: Unless otherwise specified, all results output from this point on reflect values from the Precaster Optional Design.

Section Properties

Section Properties

	Girder	Composite
Area (in^2)	817.312	1565.278
I_x (in^4)	299739.7	775644.6
I_y (in^4)	46706.8	529350.3
d (girder depth) (in)	54.000	62.500
$Y_{t\ girder}$ (in)	30.492	13.891
$Y_{t\ slab}$ (in)	-	22.391
Y_b (in)	23.508	40.109
k_t (in) (Top kern point)	15.601	-
k_b (in) (Bottom kern point)	12.027	-
$S_{t\ girder}$ (in^3)	9830.1	55839.3
S_b (in^3)	12750.6	19338.2
$S_{t\ slab} = n(I_x/Y_{t\ slab})$ (in^3)	-	34641.5
Q_{slab} (in^3)	-	13568.6

For Help, press F1 Modified NUM

PGSuper - Untitled - [Toga Plugin]

File View Help

Bridge Input | Girder Input | Girder View | Analysis Report

Show: Long Report

Loading Details

Uniform Loads Applied Along the Entire Girder

Load Type	w (kip/ft)
Girder	0.851

Slab Load Applied Between Bearings

Slab Load is uniform along entire girder length.

Load Type	w (kip/ft)
Total Slab Weight	0.779

Overlay

Overlay load is uniform along entire girder length.

Load Type	w (kip/ft)
Overlay Weight	0.000

Overlay load is distributed using tributary width.

User Defined Loads

Locations are measured from left support.

Distributed Loads

Stage	Load Case	Start Location (ft)	End Location (ft)	Start Magnitude (kip/ft)	End Magnitude (kip/ft)	Description
Bridge Site 1	DC	0.000	74.777	0.000	0.000	w non-comp, dc
Bridge Site 2	DC	0.000	74.777	0.000	0.000	w comp, dc

For Help, press F1 Modified NUM

PGSuper - Untitled - [Toga Plugin]

File View Help

Bridge Input | Girder Input | Girder View | Analysis Report

Show: Long Report

Bridge Site 2	DC	0.000	74.777	0.000	0.000	w comp, dc

Prestress Force and Strand Stresses

Strand Stress at Various Stages of Prestress Loss at Girder Mid-point

Loss Stage	Permanent Strand			
	Force (kip)	Loss (KSI)	Stress (KSI)	% Loss
At Jacking	929.48	0.000	202.500	0.00
Before Prestress Transfer	920.39	1.980	200.520	0.98
After Prestress Transfer	866.38	13.746	188.754	6.79
At Lifting	866.38	13.746	188.754	6.79
At Shipping	866.38	13.746	188.754	6.79
After Deck Placement	744.38	40.326	162.174	19.91
After Superimposed Dead Loads	744.38	40.326	162.174	19.91
Final	744.38	40.326	162.174	19.91

Camber and Deflections

Stage	Original Girder Design		Fabricator Optional Design	
Estimated camber at 120 days, D	1.594 in	0.133 ft	2.097 in	0.175 ft
Estimated camber at 120 days, D	1.594 in	0.133 ft	2.097 in	0.175 ft
Deflection (Prestressing)	1.236 in	0.103 ft	1.446 in	0.121 ft
Deflection (Girder)	-0.548 in	-0.046 ft	-0.548 in	-0.046 ft
Deflection (Slab and Diaphragms)	-0.366 in	-0.030 ft	-0.366 in	-0.030 ft
Deflection (User Defined DC)	0.000 in	0.000 ft	0.000 in	0.000 ft
Deflection (User Defined DW)	0.000 in	0.000 ft	0.000 in	0.000 ft
Screed Camber, C	0.366 in	0.030 ft	0.366 in	0.030 ft
Excess Camber (based on D at 120 days)	1.228 in	0.102 ft	1.731 in	0.144 ft
Live Load Deflection (HL93 - Per Lane)	-0.455 in	-0.038 ft	-0.455 in	-0.038 ft
Optional Live Load Deflection (LRFD 3.6.1.3.2)	-0.110 in	-0.009 ft	-0.110 in	-0.009 ft

For Help, press F1 Modified NUM

PGSuper - Untitled - [Toga Plugin]

File View Help

Bridge Input | Girder Input | Girder View | Analysis Report

Show: Long Report

Stress Checks

Specification = TxDOT 2010

Notes:

• Calculated total external load top and bottom stresses are multiplied by the appropriate (Top or Bottom) ratio of (Input Design Load Stress)/(Calculated Stress). This results in the Analysis Stress

• Stress Checks reflect the following sign convention: Compressive stress is negative. Tensile stress is positive.

Stress Check for Service I for Casting Yard Stage (At Release) [5.9.4.1.2]

For temporary stresses before losses in pretensioned components

Allowable tensile stress = $0.2400\sqrt{f'_{ci}}$ = 0.480 KSI

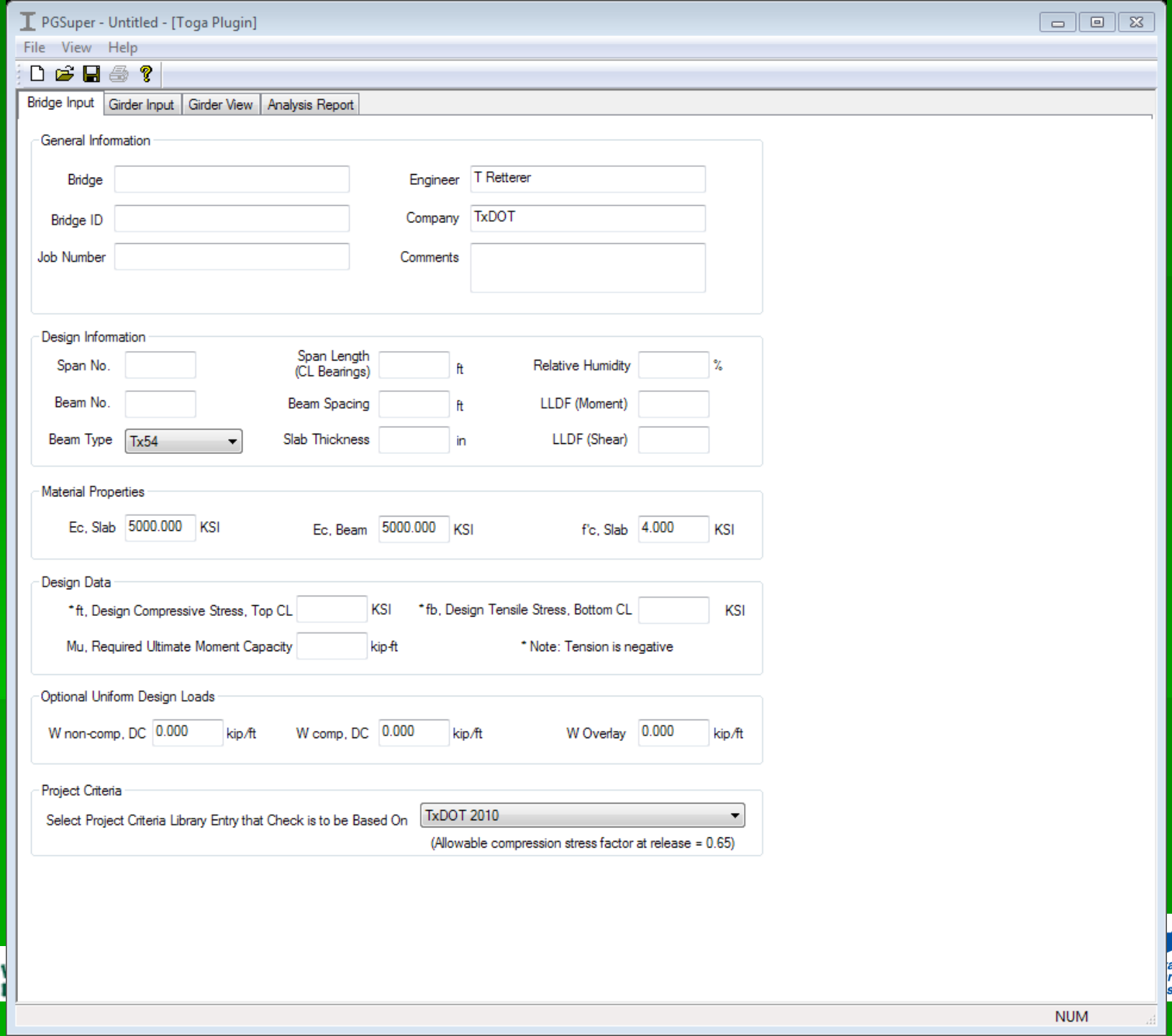
Allowable tensile stress = $0.2400\sqrt{f'_{ci}}$ = 0.480 KSI if at least 1.588 in^2 of mild reinforcement is provided

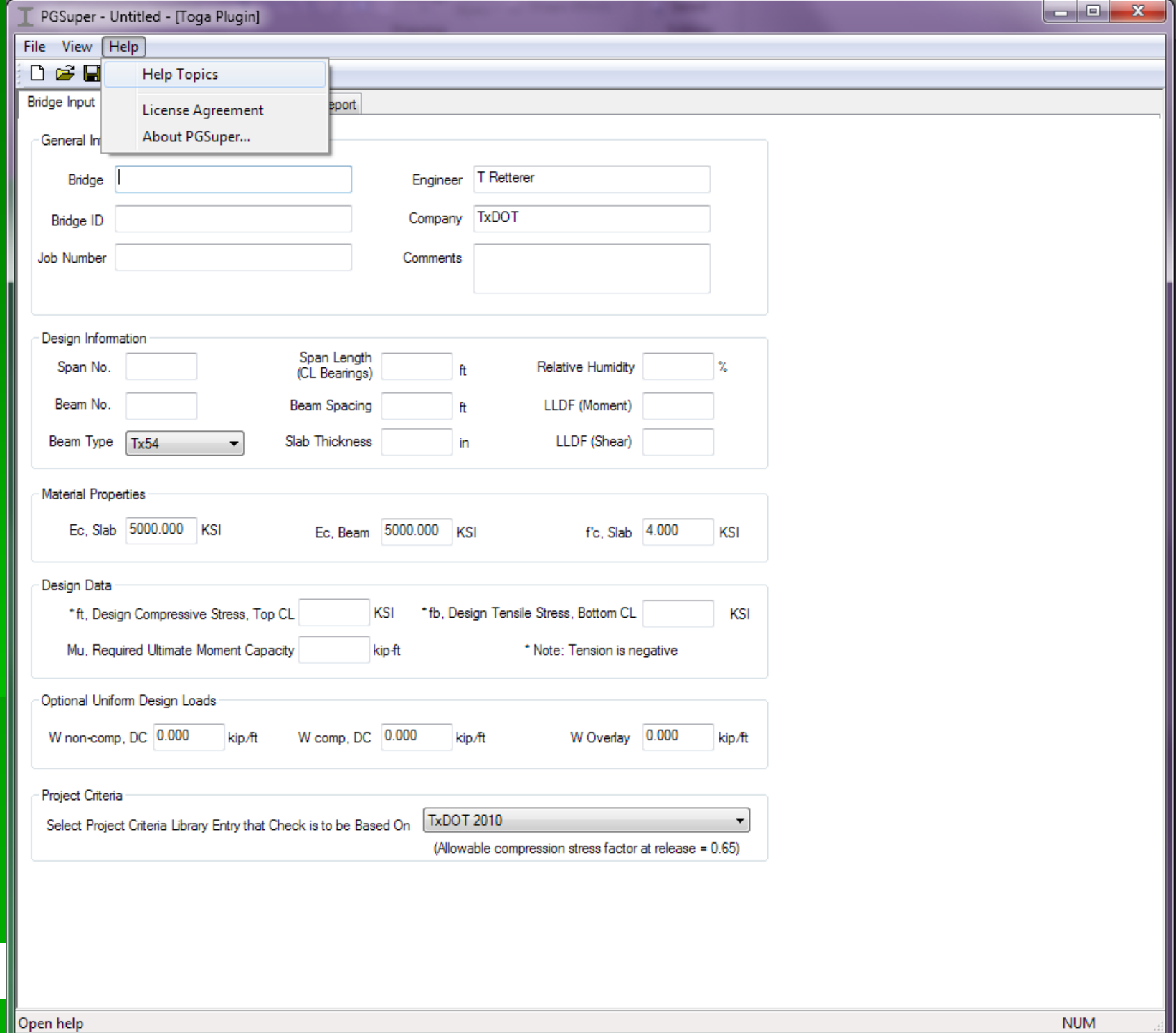
Allowable compressive stress = $-0.65f'_{ci}$ = -2.600 KSI

f'_{ci} required to satisfy this stress check = 3.771 KSI

Location from End of Girder (ft)	Prestress		Service I		Demand		Tension Status w/o rebar (C/D)	Tension Status w/ rebar (C/D)	Compression Status (C/D)
	f_t (KSI)	f_b (KSI)	f_t (KSI)	f_b (KSI)	f_t (KSI)	f_b (KSI)			
($0.0L_g$) 0.000	0.000	0.000	0.000	0.000	0.000	0.000	Pass (∞)	Pass (∞)	Pass (∞)
(PSXFR) 0.008	0.466	-2.206	-0.000	0.000	0.466	-2.206	Pass (1.03)	Pass (1.03)	Pass (1.18)
0.750	0.467	-2.207	-0.029	0.023	0.437	-2.185	Pass (1.10)	Pass (1.10)	Pass (1.19)
(H) 4.500	0.468	-2.214	-0.168	0.129	0.300	-2.085	Pass (1.60)	Pass (1.60)	Pass (1.25)
5.792	0.469	-2.216	-0.212	0.164	0.256	-2.053	Pass (1.87)	Pass (1.87)	Pass (1.27)
($0.1L_g$) 7.628	0.469	-2.219	-0.272	0.210	0.197	-2.009	Pass (2.44)	Pass (2.44)	Pass (1.29)
8.228	0.469	-2.220	-0.291	0.224	0.178	-1.996	Pass (2.69)	Pass (2.69)	Pass (1.30)
($0.2L_g$) 15.255	0.471	-2.230	-0.484	0.373	-0.012	-1.857	Pass (-)	Pass (-)	Pass (1.40)
15.705	0.472	-2.230	-0.494	0.381	-0.023	-1.849	Pass	Pass	Pass

For Help, press F1 Modified NUM


PGSuper - Untitled - [Toga Plugin]
File View Help
Bridge Input
Girder Input
Girder View
Analysis Report
General Information
Bridge
Bridge ID
Job Number
Engineer
T Retterer
Company
TxDOT
Comments
Design Information
Span No.
Beam No.
Beam Type
Tx54
Span Length (CL Bearings)
ft
Beam Spacing
ft
Slab Thickness
in
Relative Humidity
%
LLDF (Moment)
LLDF (Shear)
Material Properties
Ec, Slab
5000.000
KSI
Ec, Beam
5000.000
KSI
f'c, Slab
4.000
KSI
Design Data
*ft, Design Compressive Stress, Top CL
KSI
*fb, Design Tensile Stress, Bottom CL
KSI
Mu, Required Ultimate Moment Capacity
kip-ft
* Note: Tension is negative
Optional Uniform Design Loads
W non-comp, DC
0.000
kip/ft
W comp, DC
0.000
kip/ft
W Overlay
0.000
kip/ft
Project Criteria
Select Project Criteria Library Entry that Check is to be Based On
TxDOT 2010
(Allowable compression stress factor at release = 0.65)
NUM


PGSuper - Untitled - [Toga Plugin]
File
View
Help
Help Topics
License Agreement
About PGSuper...
Bridge Input
eport
General In
Bridge
Engineer
T Retterer
Bridge ID
Company
TxDOT
Job Number
Comments
Design Information
Span No.
Span Length (CL Bearings)
ft
Relative Humidity
%
Beam No.
Beam Spacing
ft
LLDF (Moment)
Beam Type
Tx54
Slab Thickness
in
LLDF (Shear)
Material Properties
Ec, Slab
5000.000
KSI
Ec, Beam
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*ft, Design Compressive Stress, Top CL
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W Overlay
0.000
kip/ft
Project Criteria
Select Project Criteria Library Entry that Check is to be Based On
TxDOT 2010
(Allowable compression stress factor at release = 0.65)
Open help
NUM

TOGA

Hide Back Print Options

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    - Girder View Tab
    - Analysis Report Tab
- Theoretical Manual
- Administrator Guide

Bridge Input Tab

This tab contains bridge-level data related to the project.

Note: All data on this tab must be filled in prior to visiting other tabs.

General Information

The General Information group contains textual data used to describe the current project in TOGA reports. None of this data affects the analysis.

Bridge	Name of the Bridge
Bridge ID	TxDOT Bridge Identification Number
Job Number	CSJ
Engineer	-
Company	-
Comments	Any additional text to be included in report

Design Information

This group contains bridge-level design information

Span No	Span where the beam is located. (textual information only)
Beam No	Beam number. Generally numbered from left to right facing up-station. (textual information only)
Beam Type	Type of beam in question. *Note that changing beam type will reset the strand data on the Girder Input tab to Standard Strand Fill with zero strands.*
Span Length	Length of span as measured between bearing centerlines in feet.

Submission of Optional Girder Design

- Shop drawings
- Sealed optional design calculations (the Short Report)
- TOGA file

Washington State Department of Transportation

PGSuper

Texas Department of Transportation

Questions

- PGSuper Help Desk
  - TxDOT_PGSuperHelp@txdot.gov

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